

# MINNESOTA MEDICINE

*Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society*

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

Volume XIII  
Number 2

FEBRUARY, 1930

25 cents a copy  
\$3.00 a year

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VOL. XIII

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## A REPORT OF FOUR CASES OF INOPERABLE CARCINOMA TREATED WITH INTRAMUSCULAR INJECTIONS OF KARKINOLYSIN\*

ADOLPH M. HANSON, M.D.  
*Faribault, Minnesota*

**K**ARKINOLYSIN is an extract of the giant epithelial cells of the neck-thymus of young calves.

There is no need of my going into the results in any detail of work done on extirpation of the thymus or of thymus extracts that have been used. The consensus of opinion is that the thymus has something to do with the growth of bone; that it bears some relationship to the genital system in that it is supposed to atrophy after puberty and that castration causes a persistent growth of the thymus, and that its removal causes a hastening in the development of the testes; that it is concerned, especially, in the synthesis of nucleic acid. Achondroplasiac calves have exceptionally large thymic bodies with absence or mere vestiges of the thyroid. The extracts that have been used experimentally have been watery and alkaline extracts, containing the elements of the lymphoid structure and not the true thymus, and contain a large percentage of nucleohistone as similar extracts of lymph glands. This is thrown out of solution by acetic acid.

My supposition, or hypothesis (note that I do not even designate it as a theory), is that the giant epithelial cell of the thymus is the true thymus and that it subserves the function of controlling the correct, normal and healthy rate of epithelial mitosis and cell-division. Another hypothesis that I have considered is that the epithelial cells of the thymus, under certain abnormal or diseased conditions, may get into the lymphatic system and grow again in other locations. However, I have discarded this for the

former, as carcinoma takes on the characteristics of the tissue or organ in which it originates: as adenocarcinoma in secretory glands and follicular structures as in the stomach, ovary, etc.

On this basis I decided that the true thymus effect could not be determined unless the lymphoid "muck" could be largely excluded and an extract secured from the giant epithelial cells. In other words: true thymus effect can only be secured when an extract of true thymus is available in a sufficiently concentrated and pure form to render it suitable for use in the treatment of carcinoma in the human. The earliest origin of the thymus is epithelial and it is logical to presuppose that the epithelial elements constitute the true thymus and contain the hormone peculiar to itself.

I have made use of an original method that breaks down the tissue structure of the thymus and excludes the fibrous tissue of the capsule and interlobular structure in addition to a large amount of the lymphoid elements. The extract apparently contains no nucleohistone as no precipitate is secured on the addition of acetic acid. Each c.c. of Karkinolysin (Hanson) represents 0.6 gm. of the fresh gland and has a protein content of about two per cent.

I give it intramuscularly for two reasons: first, because I know that it is effective when given this way; second, because there is much less local reaction and the comfort of the patient under treatment must be considered. It must be given daily in 1 c.c. doses as the lysin effect is best brought about in this way. Perhaps it could be given every twelve hours and in larger doses, but I have secured results by daily intra-

\*From the Chemical Research Laboratory, Faribault, Minnesota. Read before the Rice County Medical Society at Faribault, Minnesota, December 11, 1929.

muscular injections of 1 c.c. in inoperable carcinomas involving the peritoneal cavity. This is pioneer work. The dosage is necessarily empirical, but I have found that 0.6 gm. of the fresh gland to each c.c. is about all the extract will

the skin. Of the five sisters, two died of primary carcinoma of the liver which was discovered at autopsy. Attention also is called to the report of Freund and Kaminer that the serum and extract of the organs of cancer subjects do

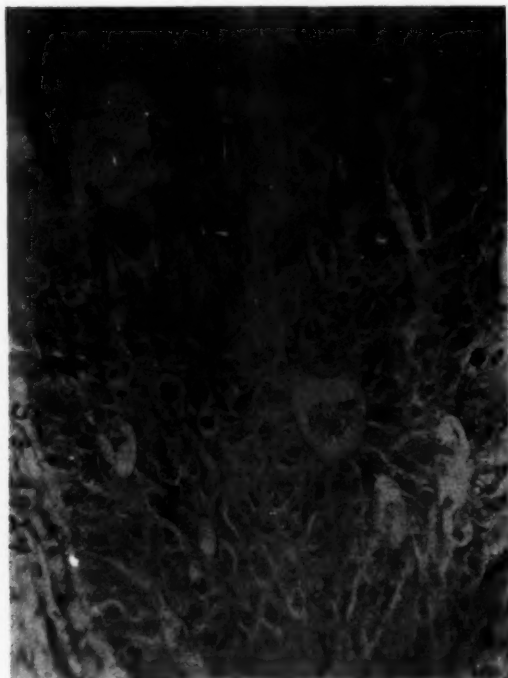


Fig. 1. Microphotograph of the tissue in Case 1, showing the cellular structure.



Fig. 2. Low power view of gland removed from patient in Case 2, showing the malignant growth extending beyond the capsule of the gland.

hold and produce a clear product with the protein content at about two per cent.

The treatment is carried out by daily intramuscular injections for three to six months, or thirty days beyond the time when all evidence of the disease has disappeared. Such cases must be under the absolute control of the physician, preferably in a hospital.

Engel† emphasizes that in our research on cancer we often consider it as a local affection and overlook the organism as a whole, and yet it is the general condition which determines whether malignant disease may develop or not. Engel relates a report by Rüder of a family in which all seven of the sons developed epithelioma of the skin at ages varying from five months to ten years. There were five girls in this family and all of them escaped such development. Incidentally, the grandfather also had epithelioma of

not destroy cancer cells in the same way as do the serum and extracts of organs of the non-cancerous. It has been demonstrated further that this faculty is twenty-one times more potent in the serum of infants than in adults, and this peculiar potency is believed to be connected with the thymus, since the potency declines as the thymus gland retrogresses.

Engel has been experimenting with the protein extracts of various endocrine glands as devised under the methods outlined by Abderhalden, the so-called "optones." He injected such solutions subcutaneously into mice at points remote from the experimental inoculations of cancer. As a result of his work, light is thrown on the potency of these protein products of different endocrine glands and on the influence of the different glands upon the production and inhibition of tumor growth. For instance, it seems that extracts of pituitary tend to promote such

†Engel: *Zeitschrift für Krebsforschung*, 19:339 (Feb.), 1923.



growths, while extracts of thyroid, and especially the thymus, check it remarkably. The elements responsible for this action seem to be the protein products.

This report led me to consider the possibility

The transverse colon was fixed in a left inguinal wound and a fecal fistula established forty-eight hours later. On February 6, 1924, my first thymic extract was given intramuscularly in a dosage of 1 c.c.†

One c.c. was given intramuscularly on the following day, and 2 c.c. intramuscularly every day thereafter un-

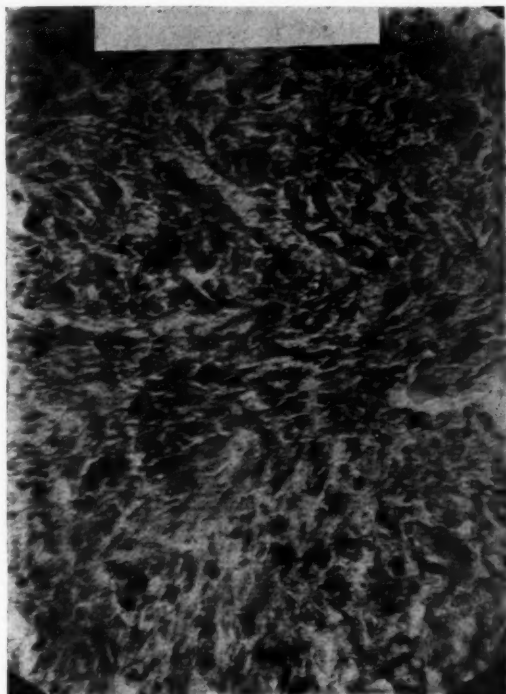


Fig. 3. The general arrangement is shown of the cells in rows in the gland removed from patient in Case 3.

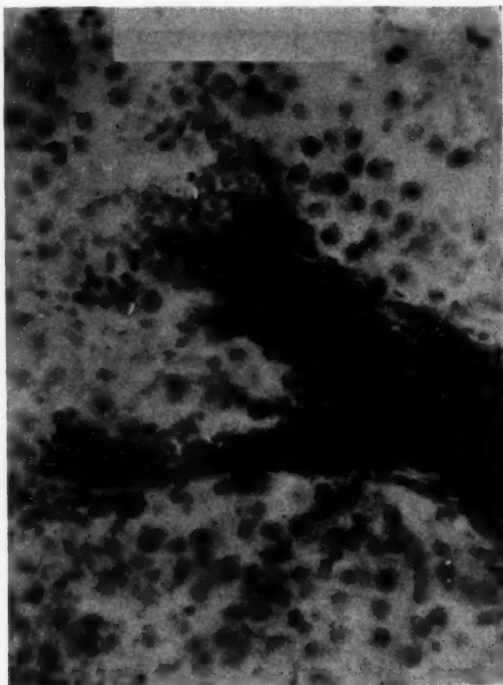


Fig. 4. High power microphotograph, Case 3, showing the end of a trabecula in the gland surrounded by the metastatic epithelial cells.

of extracting true thymus activity, and in laying my groundwork for this study I decided to make a histological study of the bovine thymus and to study it grossly in the animal. This was followed by the chemical work in my laboratory which resulted in the production of Karkinolsin, the extract of thymus which has been used in the cases which follow.

#### CASE REPORTS

*Case 1.*—Mrs. J. S. White. Married. Age 56.

This woman was brought to St. Lucas Hospital, Faribault, Minnesota, on January 23, 1924, suffering from almost complete obstruction of the splenic flexure of the colon, which became complete, necessitating operation on January 28, 1924. At operation a large annular carcinoma, the size of a clenched fist, was found at the splenic flexure, completely occluding the bowel. It was densely adherent to the surrounding structures and a few enlarged glands were palpable.

til February 25, 1924, when the last injection was given. A total of twenty injections were given: 2 of 1 c.c. each, and 18 of 2 c.c. each.

On February 26, 1924, the abdomen was again opened and much to our surprise the mass was much reduced in size, in fact smaller than the circumference of the normal colon, so that it appeared as though a band had been tightly drawn about the bowel constricting it. It was no longer adherent to the surrounding structures and the enlarged glands had disappeared. The splenic flexure, with its hard constricted area, was brought well outside of the abdomen and fixed by interrupted sutures. On February 28, 1924, the loop of extruding bowel was removed by cautery and large clamps applied to re-establish anastomosis.

This patient enjoyed perfect health, with the excep-

†My first thymic extract used clinically represented only 0.03 gm. of the fresh gland to each c.c. of extract. Even when given in intramuscular doses of as high as 4 c.c., an amount of extract representing only 0.12 gm. was received by the patient. Karkinolsin, a similar extract, represents 0.6 gm. of the fresh glands to each c.c. The fact that results were secured by this crude and weaker extract suggests a hormonal action.

tion of an occasional slight discharge from a small sinus, which persisted at the site of the original fecal fistula, until the illness which resulted in her death from pneumonia in the late spring of 1928. Dr. Theodore Holtan of Waterville, Minnesota, under whose care she was at the time, stated that there was no evidence of recurrence of the malignancy at the time of her death. This



Fig. 5. Low power microphotograph of the tissue from the left ovary removed on June 19, 1929, Case 4.

patient received no x-ray treatments while in the hospital.

A good stained and mounted tissue section was prepared from a block cut from the gross specimen at the St. Lucas Hospital Laboratory on October 29, 1929. Its description follows:

Splenic flexure of colon 5 years after resection.

**Gross Description:** The tumor mass is in two parts (bowel divided in its long axis), each consisting of a solid central portion with a short segment of bowel extending out from it in directions nearly at right angles. The solid mass interposed between the two portions of intestinal lumen is fully an inch through. The tissue for examination was a block extending from the open gut into and half way through the solid mass.

**Microscopic Description:** This tissue on section is seen to be composed largely of hyperplastic abnormal masses of cells, showing clearly basic granular structure. Numerous tubular openings, cut in various directions, are present, lined by columnal epithelium; but these are embedded in irregularly shaped masses of epithelial tissue, clearly malignant in type. Mitoses are abundant. The other portions of the tissue are merely fibrous connective tissue, such as is normally found in connective tissue gland structure.

**Summary:** Adenocarcinoma.

Case 2.—Mrs. T. J. D. White. Married. Age 42.

This case was diagnosed as carcinoma involving the greater curvature of the stomach by Dr. S. B. Haessly of Faribault, Minnesota, following an x-ray examination, and operated upon by him on July 29, 1925.

At operation a large irregular hard mass, the size of a grapefruit, was found in the posterior mid-wall of the stomach, involving the greater curvature and

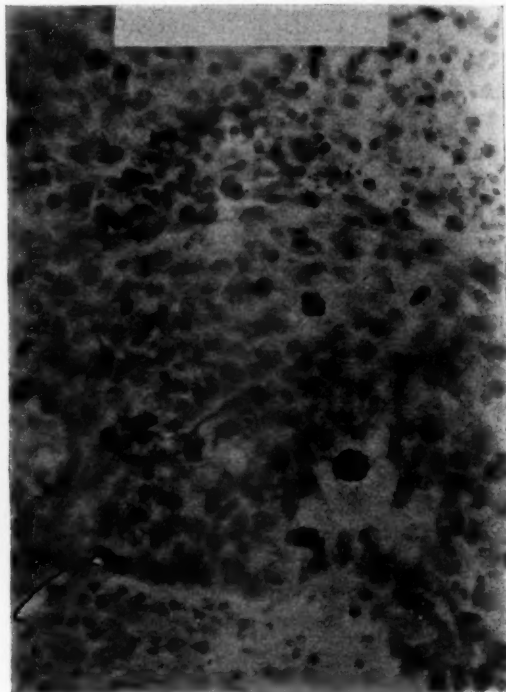


Fig. 6. High power of an area of the preceding illustration, revealing the character of the cells and the active mitosis generally seen through the section.

the lesser peritoneal cavity. The omentum, parietal and visceral peritoneum were studded with widely scattered metastatic growths. A section was removed from the tumor mass in the stomach for microscopic examination.

The tissue at the time was diagnosed from frozen section as adenocarcinoma, but the slide has been lost so I regret that I cannot offer proof of its structure. However, in the light of the other cases reported, it is not devoid of interest.

The record of the injections of my thymic extract given in this case is incomplete. She received the first injection on August 4, 1925. Ten daily intramuscular injections were given in succession, the patient being discharged from the hospital on August 15, 1925. No more injections were given until April 8, 1926, when the patient had gradually become much worse and returned for treatment. From that time, until and including June 12, 1926, she received thirty intramuscular injections in the buttocks, ranging from 3 to 4 c.c., sometimes every day, sometimes three to four days

apart. The tumor mass, eventually, could no longer be palpated. She gained in weight, took on a robust appearance and when last heard from was in good health.

**Case 3.**—M. A. K. White. Male. Married. Age 35. This man consulted me on December 17, 1928, giving a history of having had stomach and bowel trouble for the last five years. He complained of constipation and

a certain amount of lymphoid tissue adjacent to them. The major portion of the interior, however, was made up of larger cells, having epithelial characteristics, densely packed together and in places giving the indistinct appearance of being arranged in rows. The general impression is that of an invasion of lymph gland by metastatic growth of the larger cells which have



Fig. 7. Relatively low power microphotograph of the metastatic growth removed from patient in Case 4 on June 19, 1929, revealing the papillary growths.

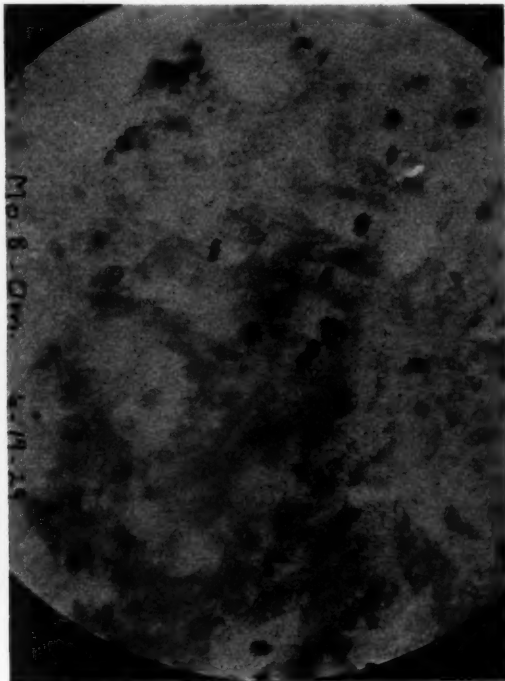


Fig. 8. High power of Figure 7, showing the character of the malignant cells and the numerous and varied mitotic figures.

severe cramps in the bowels. He had had obstruction of the bowels two years previous and was very sick. He has had two similar spells since that time, though they were not so severe.

After much study and delay, finding only a spastic condition at the recto-sigmoid junction and a gradually enlarging mass in the left abdomen, an exploratory operation was advised. Sugar in the urine was found on several occasions.

The abdomen was opened by a large left rectus incision on February 2, 1929. A large hard nodular mass, the size of a man's head and half as thick, was found retroperitoneally, extending from the region of the tail of the pancreas along the aorta, to which it was adherent, to the brim of the true pelvis. It was bound down by dense adhesions to the middle and lower thirds of the descending colon. There were palpable glands as large as hazelnuts. One of these glands, densely adherent over the mass, was removed for section and microscopic examination.

**Gross Description:** A small ovoid mass, about  $\frac{3}{4}$  inch long, enclosed in a fibrous capsule, on section showed a grayish interior.

**Microscopic Examination:** Microscopically, this showed remnants of typical lymph-gland trabeculae and

invaded this gland, but whose source cannot be definitely determined.

**Summary:** Carcinoma of unknown origin.

On March 4, 1929, he received his first intramuscular injection of 1 c.c. Karkinolysin. From this time to July 26, 1929, he received fifty-one 1 c.c. intramuscular injections of Karkinolysin.

On August 14, 1929, he returned, complaining of pain in the left side of his neck, head and left arm. Large glands could be palpated in the lower posterior triangle of the neck on the left side. A blood examination at this time revealed: R.B.C. 5,440,000; W.B.C. 5,000. Differential Count: P.M.N. 65; lymphocytes 23; mononuclears (large) 5; eosinophiles 1; myelocyte 1; undetermined 5.

On August 26, 1929, he received Karkinolysin 1 c.c. intramuscularly. He did not return until September 21, 1929, when the mass was the size of a large apple and the pain and discomfort was so great that he received no relief from large doses of morphine hypodermically. He could not sleep at night and the pain was almost unbearable.

On September 27, 1929, I made the following notation on his history record: "Metastasis at the site of the thoracic duct emptying into the left subclavian vein." After three daily 1 c.c. intramuscular injections of Karkinolysin, he stated that he could turn over in bed and that the pain was much relieved. After seven injections, on October 4, 1929, the record notes that the

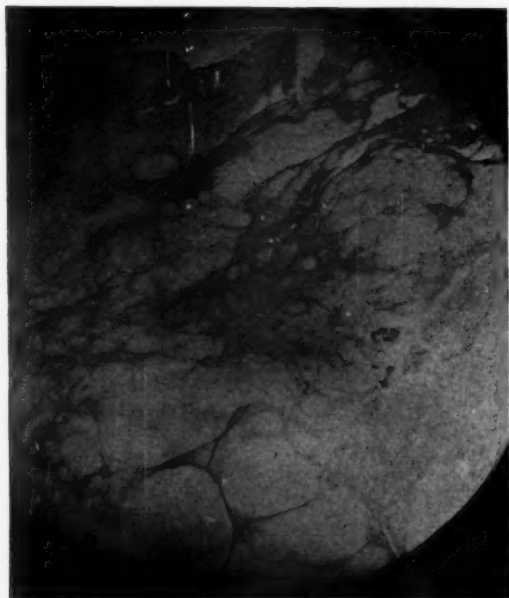


Fig. 9. Low power, showing the general appearance of the tissue from the right ovary removed from patient in Case 4, August 30, 1929.

swelling in the neck is decreasing rapidly. After fourteen injections, the last on October 17, 1929, he did not return until October 20, 1929. At that time, he stated that he had severe chills on October 18 and thought that he was coming down with the "flu" and did not dare to venture out the next day. His temperature was normal; he felt well and seemed perfectly well on October 20, and the mass in the neck was no longer apparent and barely palpable as a small soft mass, the size of a small hazelnut, behind the left clavicle deep in the neck. The Karkinolysin treatment was continued daily and he is still receiving daily injections.

On March 19, 1929, this man weighed 152 pounds; on July 16, 1929, 157 pounds; on September 29, 1929, 164 pounds; and on October 20, 1929, 167 pounds.

The abdominal tumor is no longer palpable and, at the time of writing this paper, he feels better than he has felt since two months prior to his operation.

*Case 4.*—Mrs. A. A. M. White. Married. Age 49. This woman consulted me on April 27, 1929, complaining of soreness in the abdomen, heartburn and indigestion—worse last fall and again this spring. Cystitis symptoms were present with a soreness in the pelvis. She had not menstruated since January, 1929, and was very irregular the preceding year. After thorough ex-

aminations, a diagnosis of large multiple fibroids was made and operation advised. She was operated upon on June 19, 1929, at which time the gross findings were malignancy involving both ovaries, omentum, and the peritoneum of the anterior abdominal wall and pelvis. Three large metastatic growths were found in the omentum.

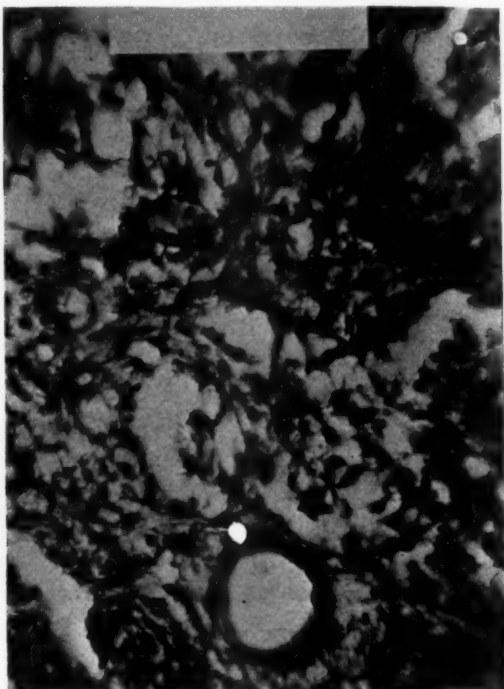


Fig. 10. Appearance of a small area under the high power, showing the general appearance of the tissue and the absence of cellular elements in the right ovary, Case 4.

The right ovary and uterus were so densely adherent over the iliac vessels and in the pelvis that removal was impossible. The large left ovary and one of the metastatic growths in the omentum were removed and delivered to the St. Lucas Hospital Laboratory.

*Gross Description of Ovary:* Large multilocular ovary containing hard masses and numerous cysts.

*Microscopic Description of Two Blocks of Tissue Removed from Left Ovary:*

1. This is composed mainly of closely packed epithelial cells surrounding numerous rounded and elongated spaces which are lined by simple columnar epithelium, not set off from surrounding cells by basement membrane. Many of these spaces contain blood-cells. Others are filled by a substance resembling colloid of the thyroid gland, while still others are empty. Throughout this epithelial tissue, mitotic figures are abundant. This section contains almost no connective tissue, except that along one margin. A thick band representing a part of an enclosing capsule is seen.

2. This section consists of a network of broad bands



of connective tissue, within and between which are spaces only partly filled by epithelial cells which line the spaces, in places as a simple columnar epithelium with a distinct gland-like lumen, in others being filled with piled up masses filling the spaces more or less completely, while in still other places there are distinct papillary extensions from the epithelial wall closely

completely filled by papillary ingrowths from the walls. The papillary growths are covered by columnar epithelium which is simple lining layers in some, but in older growths is piled up in layers of several to many thicknesses, nearly filling the lumen of the cysts. The mitotic figures are very numerous in this epithelium and the blood supply is abundant.



Fig. 11. Microphotograph under low power showing the appearances of the metastatic growth removed from patient in Case 4, August 30, 1929. Note the large area of myxomatous-like tissue in the center, separating cellular areas.

packed. The framework is infiltrated with small round cells in places. In others it appears as essentially normal ovarian stroma.

These various conditions evidently represent various stages in adenomatous transformation towards massive or solid carcinoma. The abundant mitoses and abundant blood supply indicate a high degree of malignancy.

**Summary:** Rapidly developing papillary adenocarcinoma of cystic ovary.

**Gross Description of Metastatic Growth in Omentum:** The omentum is greatly thickened ( $\frac{3}{4}$  inch thick). The whole surface is covered by masses of fatty tissue about the size of a grain of wheat. When cut open, however, the interior is largely made up of white rounded masses of varying size from that of a pinhead to that of a pea.

**Microscopic Description of Section from Metastatic Mass in Omentum:** Upon microscopic examination these white masses are found to be cysts more or less

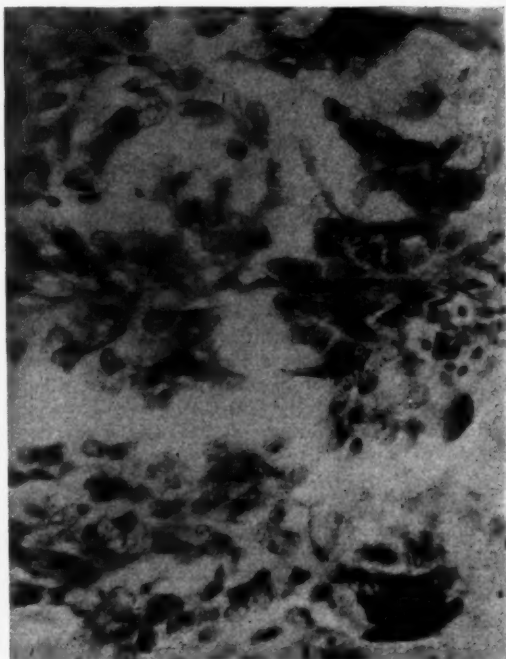


Fig. 12. High power microphotograph of an area of Figure 11, showing the general average appearance of the cellular portions. Note the poor staining qualities of many of the cells and the relatively large areas in which the cells are no longer found.

**Summary:** The metastatic omental growth is a papillary cystic adenocarcinoma.

The patient in Case 4 was discharged from the hospital on July 4, 1929, and the Karkinolysin treatment was started on July 16, 1929, daily injections being given. On August 2, 1929, the remaining mass was much smaller and she complained of very little tenderness. On this date she received 1.5 c.c. Karkinolysin intramuscularly and her weight was 166 pounds. From that time until August 25, 1929, she received three injections of 2 c.c. each. Her weight on August 25, 1929, was 176 pounds and she felt very well, though she had had several slight hemorrhages from the uterus and the abdomen was rapidly growing larger.

On August 30, 1929, she was again operated upon because of the large cystic right ovary, which was causing increased discomfort in that it distended the abdomen like a large full-term pregnancy. At operation it was found that the large cystic right ovary was completely free from the iliac vessels, except where

densely adherent to the uterus. The adhesions had largely disappeared and the two remaining omental metastatic growths, which were left at the first operation in June, were apparently no larger and no evidence of more growths could be found. The glands in the pelvis and the growths in the peritoneum of the anterior abdominal wall had disappeared. The enlargement of the right ovary was entirely due to the formation of more fluid within the cysts, of which quarts were evacuated, and most of the remaining right ovary was removed. At its attachment to the uterus, the uterus was deeply cauterized with the Percy cautery. The two remaining metastatic growths in the omentum were removed with parts of the omentum and with the ovarian tissue were delivered to the St. Lucas Hospital Laboratory. It was necessary to sever the right broad ligament to expose the attachment of the ovary to the uterus.

*Gross Description of Tissues:* Masses of right ovary in four pieces, which include practically all of right ovary. Two large pieces of omentum. The pieces of ovary are changed so that there is no anatomical resemblance to ovary, but are simply masses of white tissue. The pieces of omentum each contain a hard mass made up of closely adherent masses of carcinomatous-like tissue and represent areas all the way from the size of a pinhead to the size of a walnut.

*Microscopic Description of Ovary:* No mitotic figures seen. The spaces previously occupied by epithelial growths are represented by a very loose myxomatous-like tissue. Epithelial cells have disappeared. Blood supply not conspicuous.

*Summary of Ovary:* Myxomatous-like tissue replacing epithelial tissue.

*Microscopic Description of Omental Metastatic Growths:* Much epithelial tissue in dense masses showing very little open space between the masses. The papillary framework of the epithelial tissue has largely disappeared, so that the epithelial tissue appears to be nearly solid masses surrounded and enclosed by strings of fibrous framework. Some extravasated blood found between epithelial tissues, which may be the result of trauma. Various degenerative changes in the cells with vacuolization and cell-death. The structure of the nuclei is faint and indefinite. No mitotic figures seen, except in one small area (see slide marked "X") where the cells appear clean cut with well defined nuclei and among which mitotic figures are seen. The small area in this section is in sharp contrast to the rest of the section, and other sections.

The author realizes that the diagnoses of types of malignancy may be questioned by experts in this field, but he hopes that the descriptions of the tissues, with the clinical and operative findings, will offer sufficient evidence of malignancy and the changes which took place after treatment.

In the last mentioned case, the only case in which it was possible to note clinical, operative and pathological findings before and after treatment by Karkinolysin, the significant facts are:

The disappearance of enlarged glands and growths

in the peritoneum (also noted in the first case reported);

The arrest of metastasis;

The changes in the original metastatic growths, which are: a breaking down of the malignant cells with vacuolization, fading staining qualities and indefinite nuclei; their replacement by a myxomatous-like, or fibrous-like, tissue; and the almost total absence of mitotic figures, and these only found in one small isolated area, like one remaining machine-gun nest after all the rest of the enemy has been wiped out.

I do not attach great significance to the microscopic appearance of the right ovary (having failed to remove a section from this ovary at the first operation), as it may be argued that malignancy never existed in the right ovary. The same cannot be said about the metastatic omental growths. The fact, however, that this right ovary was densely adherent in the pelvis and to the iliac vessels at the first operation and that these adhesions had disappeared at the time of the second operation is suggestive of malignancy in this ovary, also, and a lysis effect from the treatment.

This last patient had a discharge from the wound for some weeks following the operation and a high temperature. This discharge contained small particles of tissue, possibly from the cauterized area in the uterus. At the time of the writing of this paper she is steadily improving and the uterus is diminishing in size. No more uterine hemorrhages have occurred.

In the first three cases reported, we have only the operative and clinical evidence of carcinoma, with seemingly pronounced benefit in two of them, the tissue evidence of one of them being lost. In two of them we have the pathological tissue as evidence of carcinoma.

The last two cases are too recent to state the condition three to four years following treatment, but the tissue studies in the last case, before and after ten weeks treatment, are significant. The microscopic examinations of the tissues removed at the first operation in the last reported case indicate a high degree of malignancy. Whether or not this case becomes eventually apparently cured, or other rapidly growing cases of malignancy will respond so readily, or become arrested in every instance, remains to be seen when numerous cases have been treated over periods of three to six months, or longer. If Karkinolysin will give relief in only fifty per cent of the cases and prolong life, even if it does not result in permanent cure, it will be a great boon to humanity. In view of the fact that this case was a rapidly growing malignancy of high degree, the findings are only the more significant.

It has been impossible to treat all of the carcinoma patients who have been under the au-

thor's care since 1924 with Karkinolysin. Only the cases of inoperable carcinoma that could be induced to submit to experimental treatment and who stayed by it could be used in this work. After five years, this is all I have to report. The chemical work, which has been the greatest task of all, will not be reported unless it can be shown that Karkinolysin is of as real value as my clinical experience seems to indicate in these four cases. If clinical investigators can duplicate and multiply these results, Medicine will take another step in the right direction. I feel that it is deserving of such a trial, as Karkinolysin is an exceptionally pure extract, with a protein content of only about two per cent. A substance that can bring about such changes in carcinoma as Karkinolysin has accomplished in these four cases deserves our most serious and earnest attention. I do not offer it as a cure for cancer, but as a cancer-solvent, a product that seems to inhibit cancer by breaking down the malignant cells and replacing them by non-malignant issue. The object of my study has been: WHY CANCER? I hope that I am correct in my supposition that cancer is due to a hypothermia, or an athymemia, and that Karkinolysin replenishes this deficiency in the body.

All of these cases received a few deep *x*-ray treatments after leaving the hospital, but the effect was necessarily negligible, especially in the treatment of the abdominal growths, as the *x*-ray machine used was not a heavy duty treatment apparatus, was not capable of carrying a heavy load and no water-cooled tube was available.

#### SUMMARY

The four cases treated have all shown definite temporary improvement. The treatment seems to cause a necrosis, softening and absorption of at least a part of the tumor. Whether or not a

complete destruction takes place has not yet been determined. This may be a partial destruction, as occurs in some cases treated by lead and *x*-rays. That this effect may be due to a foreign protein must also be considered.

#### ACKNOWLEDGMENTS

I am greatly indebted to W. S. Nickerson, M.D., Sc.D., for his study of the pathological tissues reported in this paper; to Sister Amalia of the St. Lucas Hospital Laboratory for the taking of the microphotographs and her assistance in preparing tissue sections; to Dr. S. B. Haessly of Faribault, Minnesota, for consenting to and treating the second case in this series; to Dr. Theodore Holtan of Waterville, Minnesota, for the continued treatment of the last case reported; to E. O. Ellingson, Ph.D., Professor of Chemistry at St. Olaf College, Northfield, Minnesota, for Kjeldahl checks to accurately determine the protein content of Karkinolysin; to Sister Caroline and the Operating Room nurses at St. Lucas Hospital for the autoclaving of my 10 c.c. vials in which Karkinolysin is distributed to clinical investigators and laboratory workers; and to Swift & Company and their Mr. C. P. Kaufmann for their always helpful coöperation in so promptly furnishing me with fresh neck-thymi from young calves for my chemical work.

#### REFERENCE

Hanson, Adolph M.: The Bovine Thymus: A brief description and histological study. *Minn. Med.*, 13:17 (Jan.), 1930. •

*Note:* Other cases are now undergoing treatment by the author and other investigators. If my results can be duplicated, other reports will be made by various investigators regarding its use in the treatment of carcinoma in human beings, as well as its effect in carcinoma in rats. A publication in the near future will describe the method used in the preparation of Karkinolysin.

## THE TUBERCULOUS CHILD\*

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THE brightest beacon that has ever lighted the paths of warriors against tuberculosis is our newer knowledge and better understanding of the disease in childhood. Through tuberculosis in this age period we hold the master key to doors that have never been open. We must learn to manipulate the key, otherwise the tubercle bacillus will continue as in the past to deal out destruction and death behind locked doors. The best method of attacking the tuberculosis problem consists of searching for tuberculous children. The following are some of the reasons why childhood is the best age period in life to study and teach tuberculosis:

1. The mind of the child is impressionable.
2. The mind of the child is retentive.
3. Children are gathered together in large groups.
4. Consent for examination is more easily obtained than in later life.
5. The tuberculosis of a community is reflected in the children of that community.
6. Tuberculosis from first infection in the body of a child is often reflected in the lung hilum region even when the initial lesion is in some remote part.

Most tuberculous children can be found by use of the tuberculin test, which, as it is applied to detect tuberculous infection in children, is harmless.

The *intracutaneous or intradermal (Mantoux) test*, because of its greater accuracy and its measure of hypersensitiveness to tuberculin, is the best of all the tuberculin tests. It has become the standard test. The following technic is employed: The surface of the skin where the test is to be applied (the forearm is usually a convenient place) is cleansed with alcohol. An accurately graduated tuberculin syringe containing a solution of old tuberculin of such strength that 0.1 c.c. contains 0.1 mgm. of tuberculin is fitted with a 26-gauge one-half-inch needle. The

needle is placed almost parallel to the surface of the skin and is gently inserted into the superficial layers. It must not pass beneath the skin. When the tip of the needle is introduced with the bevel up so the lumen is just out of sight 0.1 c.c. of the solution is slowly forced from the syringe into the skin, where it produces a wheal similar to that seen immediately after applying the Schick test. If there is no reaction in six or seven days the same procedure is repeated but with a solution of such strength that 0.1 c.c. contains 1.0 mgm. of tuberculin. If there is no reaction in six or seven days one may conclude the child is not now infected. When a positive reaction does occur either with 0.1 or 1.0 mgm. of tuberculin, it is usually visible within twenty-four to forty-eight hours after the administration. Occasionally the reaction is delayed. Therefore, when the test is negative we wait approximately one week before applying the second test. There appears a definite deep red nodule which varies in size from one-half to one inch in diameter and surrounding this nodule is a good sized pink halo. This, in extreme reactions, may extend over the greater part of the forearm.

To obtain the proper dilution of tuberculin, take 0.1 c.c. of old tuberculin and add 9.9 c.c. of filtered solution of c. p. physiological saline (0.85 per cent). This is known as dilution A. Of this dilution 0.1 c.c. contains 1.0 mgm. of tuberculin, which is the dose used when necessary to apply a second test. To prepare the dilution for the first test, to 0.1 c.c. of dilution A add 0.9 c.c. of the physiological salt solution. Of this dilution 0.1 c.c. contains 0.1 mgm. of tuberculin. When larger quantities are desired 1.0 c.c. of Koch's old tuberculin to 99.0 c.c. of physiological salt solution gives the dilution for the second test while 0.5 c.c. of tuberculin to 499.5 c.c. of salt solution gives the dilution for the first test. These dilutions should be made fresh every two or three weeks, as they deteriorate. A preservative consisting of 0.33 per cent tricresol or 0.25 per cent phenol may be added. Such preserva-

\*Presented before the Ninth Annual Midyear Conference of Wisconsin's Tuberculosis Sanatoria, Lake Tomahawk, Wisconsin, July 6, 1929, the Park Region District and County Medical Society July 10, 1929, and the Scott-Carver County Medical Society of Minnesota August 23, 1929.



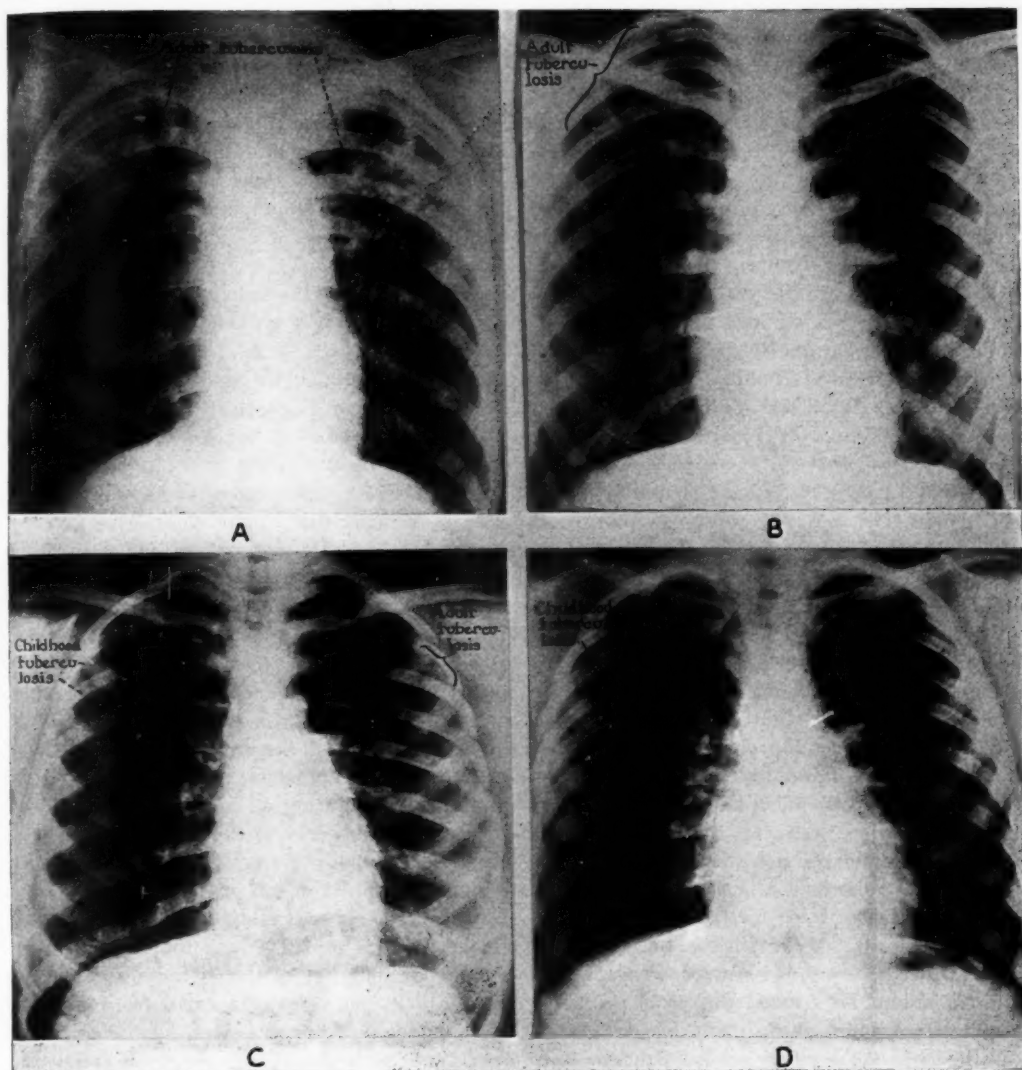


Fig. 1. Roentgenograms of four members of the same family. In 1923 a girl of fourteen years developed pleurisy with effusion. No history of tuberculosis could be obtained. Treatment was refused. In 1925 she died of pulmonary tuberculosis. The source of her infection was still unknown. Inquiry among members of the family revealed the fact that her father had been coughing with a diagnosis of bronchitis since 1920. He was advised to be examined. A few months after the daughter's death he had a frank hemorrhage from the lungs. Examination revealed chronic fibroid pulmonary tuberculosis. Thus the source of the fatal infection was pretty definitely determined through first finding disease in the child. Precautionary measures for the remaining three children were strongly recommended, but not practised. The chest conditions in this family in the spring of 1929 are seen in the illustrations as follows:

- A. J. H. Father. Age thirty-nine. Roentgenogram taken May 31, 1929. Advanced bilateral pulmonary tuberculosis, adult type. Not especially ill, but gradually losing in weight and strength.
- B. P. H. Daughter. Age sixteen years. Roentgenogram taken June 5, 1929. Childhood type of tuberculosis right hilum. Pulmonary tuberculosis, probable adult type with cavitation right upper lobe. Symptoms present.
- C. A. H. Daughter. Age fifteen years. Roentgenograms taken June 5, 1929. Childhood type of tuberculosis in the right hilum. Parenchymal involvement, probable adult type in the second interspace on the left side. No symptoms.
- D. M. H. Son. Age eight years. Roentgenogram taken June 5, 1929. Childhood tuberculosis right hilum. Apparently in good condition.

tives cause some precipitation and therefore require that fresh solutions be made every ten or twelve days.

Other tuberculin tests such as the epidermal

(Pirquet) and percutaneous (Moro) and their numerous modifications have been extensively used, but the discrepancy between them and the intradermal test has been pointed out so often

that they are rapidly being discarded and the intradermal test has become the standard tuberculin test.

If the epidermal or percutaneous tests are used, there may be an error of approximately 10 per cent. Therefore, to all who react negatively to these tests the intracutaneous test should be applied. All children who react positively should have *x*-ray examinations of the chest. The number requiring this procedure will vary a great deal in different parts of the country and in different sections of the same city. Slater observed that only 10 per cent of the children in a rich rural community reacted positively. Hetherington has found that 72.6 per cent of the children of certain schools in Philadelphia react positively. Chadwick and Zacks report that 11 per cent reacted positively in one section of a city whereas 60 per cent were reactors in another section of the same city. McCain has found 22.7 per cent of the whites and 27.34 per cent of the colored children react positively. In Rathbun's group 41 per cent of the children in the largest city and 25 per cent in the smaller towns of this county reacted positively to tuberculin. Mattill and Fenger have found approximately 22.5 per cent of the school children of small towns and rural communities reacting positively to tuberculin. Frost is finding about 26 per cent of the children with positive tuberculin reactions in a small town in his sanatorium district.

Thus, by first applying the tuberculin test, one reduces tremendously the amount of work necessary with the *x*-ray. In other words, if all children had to be *x*-rayed the problem would be quite insurmountable in many places.

In the earlier days of the study of tuberculosis among school children it was thought safe to select those below the theoretical normal weight, those with some symptoms of disease, and those from homes where tuberculous disease is known to exist, but careful observation has shown that very frequently body weight is not a safe criterion. Not uncommonly the boy or the girl considerably above the theoretical normal weight or even the athlete actively engaged in athletic sports at the time of examination is found to have tuberculous disease. Not infrequently open cases of tuberculosis exist in homes that have been entirely unsuspected. Therefore, there should be no selection whatsoever of cases but

an application of tuberculin to all and *x*-ray studies of the positive reactors.

In the past we have been terribly misguided by physical signs. The childhood type of tuberculosis usually causes no abnormal signs. Often this is true even of the adult type. Therefore, many of the clinics that are held are of little value from the standpoint of detection of tuberculous disease in childhood. No one can doubt that the clinic has an educational value, but until we reach the time when tuberculin tests are applied to every child examined and all of the positive reactors have *x*-ray studies, our clinics will continue to be of little value from the standpoint of diagnosis.

What is childhood tuberculosis? It is that disease which results from first infection from tubercle bacilli. In the past we have frequently spoken of it as the primary lesion, as juvenile tuberculosis, puerile tuberculosis, hilum tuberculosis, etc., but the American Sanatorium Association in its recent meeting in Atlantic City placed these terms in the discard and in their stead substituted the term, childhood tuberculosis.

The primary lesion may be in any part of the body. It is often in the lungs. One of the characteristics of childhood tuberculosis is that in addition to producing an area of disease at the point where tubercle bacilli invade the tissues, there very quickly appears involvement of the lymph nodes, draining lymph from that area. For example, if tubercle bacilli find lodgment in the parenchyma of a lung there will usually appear around the focus a definite area of inflammation. This may be small or it may be large enough to involve a whole lobe. Very quickly after the focus appears in the lung definite changes occur in the hilum and tracheobronchial lymph nodes on the same side. Careful *x*-ray studies will frequently reveal them. If the infection has been massive and exposure prolonged the childhood type of disease in the lung may go on to cavitation and even to fatal termination. The disease in the lymph nodes of the hilum and in the tracheobronchial nodes may also continue to progress until tubercle bacilli in large numbers find their way into the blood stream and the child dies of generalized tuberculosis.

Such, however, is not the rule in childhood. There is a strong tendency for childhood tuberculosis to heal so that as time passes the

parenchymal involvement which was surrounded by an area of inflammation shows a gradual decrease of the inflammatory process until it may completely disappear as far as *x*-ray shadows are concerned, or it may take on deposits of calcium or even may become surrounded by true bone so that by *x*-ray examination a dense shadow is cast by this small focus which we frequently speak of as Ghon's tubercle.

The tracheobronchial and hilum lymph nodes may show evidence of calcification in a very short time—five months or less, or they may remain caseous with no evidence of calcification for years.

By any phase of the examination of the living body which we know at present it is impossible to determine when the disease in the lymph nodes has completely healed. Therefore, they may be a potential danger to the child for a long time. We occasionally see such patients who are doing splendidly but who very suddenly develop generalized tuberculosis and die a meningitic death.

If the child survives it, and many of them do, some immunity or protection against tuberculosis is conferred. In other words, people who have had such disease and later develop tuberculous disease will suffer from the chronic adult type. The immunity usually is not sufficient to completely protect against massive and prolonged exposure; therefore, the child who has suffered from childhood tuberculosis should be protected from such exposure throughout the remainder of his life. This applies even to old age. If prolonged exposure is permitted the adult form of tuberculosis often develops. It usually makes its appearance in the upper part of one or both lungs. It is chronic largely because of the partial immunity which has been conferred by the childhood tuberculosis. This immunity results in a fixing of the tubercle bacilli wherever they find lodgment in the body. In other words, they remain, for the most part, in that place and are not rapidly swept off to the regional lymph nodes. Indeed, these nodes usually do not become involved in the adult type of tuberculosis. One sees rather frequently tuberculosis in the adult involving the upper lobe on one side with no involvement of the hilum or tracheobronchial lymph nodes in a patient who has unmistakable evidence of old childhood tuberculosis with a Ghon tubercle and definite calcification of the

hilum and tracheobronchial nodes on the opposite side.

The outcome in such cases of adult tuberculosis will depend upon the continuation of exposure, the amount of immunity and the general resistance or well-being of the body. In general it may be said that the adult type of tuberculosis shows far less tendency to heal than the childhood type. In other words, it is the type that kills.

One point that we must keep in mind constantly is that the childhood type of tuberculosis may develop at any age in life. The person who reaches sixty or seventy years and has not previously been infected with tubercle bacilli but now comes in sufficient contact with them to contract tuberculosis will first develop the childhood type. On the other hand, the infant of one year or less who has had the childhood type of disease and whose exposure to tubercle bacilli continues, may develop the adult and highly fatal type.

Therefore, our great problems in dealing with tuberculosis among children are to stop prolonged exposure, and treat those who have become diseased. Many times the source of the exposure is not known. The best way to find the infected child is by tuberculin testing of all children, and the best way to find those with childhood tuberculosis is to *x*-ray the chests of all the positive reactors. When this is done one may find as many as three or four per cent with this type of disease. Thus there is a considerable discrepancy between the number of tuberculin reactors and those found to have childhood tuberculosis. Careful history usually reveals the fact that those with definite evidence of childhood tuberculosis have had prolonged and intimate contact exposure to the disease. It is easy to understand how children reacting positively to tuberculin but manifesting no evidence of disease by *x*-ray may have changes in the lung parenchyma or the hilum which are not sufficiently extensive to be detected by *x*-ray examination, or are obscured by shadows of the bony framework of the chest, the mediastinum and the diaphragm. Again the focus may be found in the cervical or mesenteric lymph nodes. Then, too, there are many children who receive their infections by casual contact exposure. The exposure may have been very indirect. Rathbun

believes that 75 per cent of the cases of adult type of tuberculosis appearing in the teen ages are recruited from children who previously had definite evidence of childhood tuberculosis. This greatly simplifies our problem for it is obvious that if we will detect childhood tuberculosis and institute the right procedure, we will be able to prevent much of the killing type of tuberculosis among our young adults. What are these procedures? From the childhood tuberculosis cases we must look to their associates for the source of infection. The source may be another school child or even a teacher. It may be a father or mother or some other relative who has died of the disease and hence the source has been removed. It may be a father or mother or some other relative whose disease has not been detected but may be diagnosed (Fig. 1), and the exposure stopped through this simple method. Many times since 1921 such findings have occurred at the Lymanhurst School for Tuberculous Children. By this method of approach we may save not only the child but also the unsuspected contact case, and we may save large numbers of children and adults who would have become exposed had the contact case not been detected.

Once the tuberculin testing and the x-ray examination have been completed and an attempt has been made to prevent further exposure our duties have not ended. Every child with a positive tuberculin reaction in whom disease can not be found should be kept under close observation. This applies to children who are studied in large groups, such as school children. The private physician who has a case of tuberculosis in a home such as a father or a mother is not discharging his full duty to the family when he treats that patient alone. Over and over again tuberculosis has been shown to be a family disease. When an open case exists in the family the infection will spread to 60 or 80 per cent of the members of the family, and in some cases as many as 100 per cent of the members become infected. Therefore, it is the physician's duty to apply tuberculin tests to all members of the family and as many of the other contacts as will consent, and carefully examine all who react positively. The child who manifests no evidence except a positive tuberculin test should be carefully examined at frequent intervals.

The Fresh Air School, although the name is

bad in the light of present day knowledge, has done a great deal for children in different parts of the world. The first school of this kind was founded in Germany in 1904, and in 1908 a similar institution was dedicated in Providence, Rhode Island. Since that time many such schools have come into existence and from the idea evolved the Fresh Air Class Room. In 1904 and 1908 it was believed that "fresh air" took first place in the treatment and prevention of tuberculosis. Now we know that nature has well taken care of us so far as the chemical constituents of air are concerned even in most rooms where we live and work, and that in the treatment and prevention of tuberculosis air has been relegated to last place among the valuable factors employed. But along with the Fresh Air School idea came other factors in treatment such as conservation of energy and good nutrition. To such schools and class rooms are admitted not only children with tuberculous infection, but also children below par from other causes. We are hoping that the time is not far distant when the Fresh Air School and Fresh Air Class Room has a change of name, but that the work which is being done through them will be increased and continued all over the world. Summer camps for children when properly supervised are doing considerable good although the time spent in them is far too short. The physician in private practice who is assuming the responsibility for the health of the families among his clientele welcomes a school or a class room or even a summer camp where he can recommend that the infected children from his families be admitted for special care.

Another great movement was started with the Preventorium idea. The first institution of this kind in the world appeared in Farmingdale, New Jersey, in 1909. "Its purpose was to prevent the spread of tuberculosis by saving the children of tuberculous parents, removing them from their homes in city tenements, where the danger of infection was very great. It was organized on a broad, non-sectarian principle, to take children between the ages of four and fourteen, absolutely without regard to race, creed, or color." From that beginning many similar institutions have been developed. The people of Minnesota are extremely proud of the Ramsey County Preventorium, which under the medical direction of Drs. H. Longstreet Taylor and Everett K.



Geer has for many years contributed a wonderful service to the good health movement. In this institution are taken girls and boys many of whom have been made orphans by tuberculosis. Others are from families poverty stricken by tuberculosis. These children are taken into this splendid institution before they are definitely ill and while they are still good risks from tuberculosis. Special attention is given to the development of their bodies and minds so that many of them overcome their childhood disease and through the school department of the institution are prepared for life's work. This institution has prevented many children from developing the adult type of tuberculosis, exposing large numbers of contacts, becoming a charge upon the city or the county, and finally dying of tuberculosis. Hence the Preventorium idea is also economically sound.

That children tolerate tuberculous infection well if exposure is discontinued has been proved beyond doubt. Even infants will usually overcome it if conditions are good. Among more than 160 infants who were infected at the age of two years or younger, and many of whom are now of school age, we have found through our follow-up work at the Lymanhurst School for Tuberculous Children that only six have died of tuberculosis.

Every child who has developed childhood tuberculosis should have close medical observation, special care to conserve energy and to keep the body in splendid general condition. The

child may not look ill; he may not feel ill; he may even be athletically inclined when the evidence is detected, but his diseased hilum nodes or even his parenchymal involvement if in the active stage may result disastrously. Therefore, every case with the childhood type of disease in the active stage should be placed on careful treatment. In the majority of cases the disease rather quickly enters upon a period of latency. This is the period when treatment should continue, but of a less drastic nature than during the period of activity. Latency may be maintained for years; that is, complete healing may not take place for a long time, in some cases even during the lifetime of the individual. Such children need greater care than that provided by the Fresh Air School or Class Room. They need a special institution for tuberculous children. The idea of the first institution of this kind in the world was conceived by Dr. F. E. Harrington, Commissioner of Health of the City of Minneapolis. This institution was dedicated on May 31, 1921, and became known as the Lymanhurst School for Tuberculous Children. It has already served more than one thousand girls and boys. A second school of this kind was founded by Dr. W. P. Shepard and his associates in Berkeley, California, and is known as the Sunshine School. No physician desires to see children among his clientele grow to young adult life only to be stricken down by tuberculosis; therefore, every physician welcomes our newer knowledge and better understanding of tuberculosis in childhood that promises most in the control of tuberculosis.

## RELATION OF PHYSICAL FINDINGS TO LUNG PATHOLOGY\*

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THE physical diagnosis of pulmonary disorders is far from being an exact science although certainly based upon exact scientific principles. Like many other diagnostic methods it should be considered as an aid in arriving at correct conclusions. So many different conditions may masquerade under such similar physical signs that we frequently find it very necessary indeed to resort to clinical symptoms and history to aid us in making a correct physical diagnosis. So far as pulmonary diseases go it is imperative that we know both normal and morbid anatomy if we expect to make reasonably intelligent interpretations of physical findings.

A short time ago a fellow physician asked me to see one of his cases. He told me the patient was coughing up blood, that it was a lung case of some sort. So of course I went with the lung idea uppermost in my mind. The patient was an elderly man in bed in a semi-recumbent position. He was pale and thin, apparently breathing with some difficulty and frequently coughing up a mouthful of blood. He had been losing weight and strength for over a year and during the year had had at least three colds, as he said, each of which lasted about three weeks. Though the cough on these occasions was productive no blood had been raised. He had been raising blood then for two days.

I observed that the respiratory excursion was greater on his right side; also that the breath sounds were accentuated on this side. Despite the raising of so much blood, rales were conspicuously absent excepting much fine crepitation at the bases. Auscultation did not yield much to indicate any serious lung involvement. Of course pulmonary hemorrhage may arise from a very small lesion, but supposing this to have been a case of active tuberculosis of more than a year's duration we would have expected to have found more than a very small lesion. Percussion also failed to disclose any areas of relative dullness or re-

duced resonance excepting in the upper portion of the left chest, but this was not marked. All of the lower half of the left chest, front, side and back, yielded a decidedly tympanitic note. This was so noticeable that I called it to the attention of those present. At once the thought of pneumothorax presented itself, but easily audible breath sounds, accompanied by fine moist râles and a negative coin test quickly dispelled this idea. The voice and whispered sounds and fremitus added nothing suggestive of pulmonary disease. Further examination disclosed a tremendously enlarged heart, with the right border extending well beyond the right side of the sternum. A double aortic murmur was clearly heard, the liver was well below the costal region and the legs were edematous to the knees. The bloody expectoration now took on a new meaning. It was undoubtedly due to a failing heart with pulmonary congestion. The diminished resonance of the upper left chest was due to the crowding of the lung by the enlarged heart. This also was responsible for the limited left chest movement. The tympanitic note in the lower half of left chest was due to a distended colon, a condition, by the way, which sometimes masks pneumatic consolidation of the left lower lobe. The accentuated normal sounds on the right were compensatory. The x-ray showed a normal pulmonary picture.

The next case under discussion is that of a man approaching middle life—about forty years old. He was apparently in excellent health when he became ill suddenly. He experienced a pain in his left chest, some difficulty in breathing and a feeling of weakness.

Two days later I saw this patient for the first time. He was in bed in a semi-recumbent position and apparently fairly comfortable, pulse and color good, temperature normal.

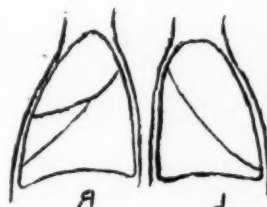
His chest was well formed and well developed. One could easily see that the excursion of the right chest was greater than that of the left. Palpation confirmed this observation and also showed tactile fremitus to be dimin-

\*Read before annual meeting of the Minnesota State Medical Association, Saint Paul, May 15, 1929.

ished over the left chest and increased over the right. Percussion disclosed a distinctly tympanitic note over the lower half of the left chest. This appeared to change toward the back. With the patient sitting bent forward a seemingly dull note was brought out in the interscapular region and over the costal angles. This change was more apparent than real. It was due to the greater thickness of the chest wall in this locality. To one not skilled and experienced in physical signs this is very deceptive. It could easily lead to the conclusion mentioned in the preceding case, namely, that the tympany over the lower left chest was due to a distended colon. Close attention to the note obtained in the interscapular region revealed its tympanitic quality, made distant however by the thicker chest wall. This deceptive relative dullness together with the sharp inspiratory crackling râles present in the same region might suggest a pneumonia or even a pleuritis, were it not for the absence of fever and rapid pulse. Moreover, the breath sounds over all the tympanitic area were distant or absent (with the exception of the interscapular region). Further observation disclosed an absence of heart sounds and apex beat. The heart could not be outlined by percussion because of tympany. During inspiration the intercostal areas between the lower left ribs posteriorly were retracted. The coin test carried its ringing overtones to the auscultator. Here was an undoubted case of pneumothorax judging from the physical signs. The clinical symptoms in association with the physical findings would classify this case as one of spontaneous pneumothorax.

We find various degrees of pneumothorax in various stages of pulmonary tuberculosis. Spontaneous pneumothorax, coming out of a clear sky, occurring in a person who is in perfectly good health so far as any one knows, is in my experience not very frequent. The symptoms are peculiar. There is a sudden sense of smothering accompanied by pain. The pain manifestation is very peculiar. The patient seems to locate it about the precordium, but as he takes a deep breath it seems to shift to the lower chest and to encircle the body. Then he says he cannot tell where it is, by which I judge it to be more or less diffused. The patient's manner is one of great uneasiness and

distress. The cases I have seen appear to have great difficulty in finding a comfortable position. They are very restless. I have known this restlessness to continue for upwards of twelve hours. The symptoms are simulated in some degree by artificial pneumothorax. I



Slide No. I. Lobes.

doubt not that the latter type of pneumothorax would be equally distressing, if as large an amount of air were introduced into the pleural cavity rapidly. When the patient takes a full breath, though pain and distress are accentuated, he does so without the halt and intermittance and stitch-like pain of pleurisy. This is quite to be expected for the pleural surfaces are not in contact. Only in case of pleural adhesions being pulled upon by the walls of the distended sac do we expect to find sharp and stitch-like pain.

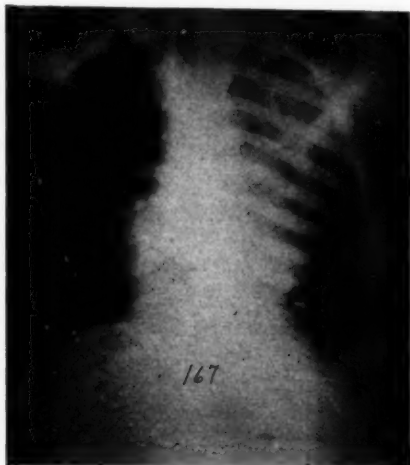
The sharp crackling râles heard in full inspiration in the case above described are easily explained. The lung is collapsed by the pneumothorax. The contraction of the diaphragm not only fills the lung on the unaffected side with air but in some degree also sucks air into the collapsed lung. The air cells of this lung are closed but dry, hence the sharp crackling as their walls snap apart. Sometimes we hear pleural friction râles quite similar to them but they are neither sustained nor regular. In a pneumonic field they change to a fine crepitation as soon as moisture appears in the air cells.

The following case is one in which the x-ray film was shown to me before I saw the patient. The history was of lobar pneumonia, crisis with immediate return and continuance of fever.

The film is a flat picture taken with the bedside unit. A flat picture does not afford any knowledge as to depth, and as no lateral view was at hand the position of the lesion in relation to the front or back of the chest could not

be determined without the aid of physical diagnostic methods.

The left lung is divided into an upper and a lower lobe. The upper lobe is thick above and thins out as it extends downward to end in a thin edge at the level of the sixth rib in front.



Slide No. II. Abscess.

The base of the lower lobe rests on the diaphragm. It thins out as it reaches upward to end in a thin edge behind at the level of the third thoracic vertebra. A line drawn from this vertebra around the side of the chest to the sixth rib in front will mark the line of division between the upper and lower lobes of the left lung.

Lobar pneumonia commonly involves an entire lobe. Therefore an *x*-ray shadow of a pneumonic lobe should show the outline of the lobe affected and should be of greatest density at the thickest part of the lobe. It should fade as the thin edge is approached. The intensity of the physical signs, especially those developed by percussion, palpation and auscultation, should be in conformity.

Looking at the film we perceive a shadow of uniform density extending as far down as the sixth rib in front. If it were pneumonia the shadow should show less density below unless a part of the lower lobe also were involved. Again the lower border of the shadow is quite rounded, so much so in fact as to suggest a distribution of the lesion not confined to lobe boundaries. So one thinks of pus.

Turning now to the physical findings: Percussion brought out a flat or dull note from the supraclavicular region to the third intercostal space in front. The dullness abruptly ended there and passed laterally and backward in a horizontal line across the axilla. Posteriorly the flat note in the suprascapular region extended down through the left interscapular space to the angle of the scapula. Laterally the note anterior to the posterior axillary line was resonant. The auscultatory sounds over the flat area were such as are heard in pneumonia only they were very distant. The distribution of the physical signs in this case located the lesion in the extreme upper end of and in the posterior part of the left chest. Upper-lobe pneumonia could be safely excluded. The lesion was too extensive to be a lung abscess. Its position was not in keeping with that of either lobe. The only possible diagnosis in the light of the physical findings was a circumscribed empyema in the upper and posterior part of the left pleural sac.

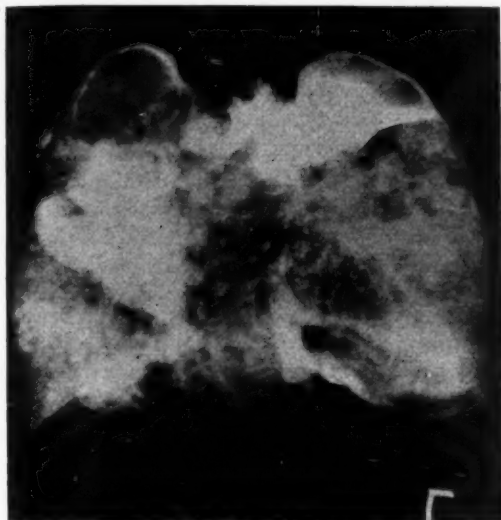
Some time ago while looking at some *x*-ray films of tuberculous chests I began to wonder what would be revealed by a film of those same lungs without an intervening chest wall. I wondered if the study of the films of the naked tuberculous lungs would be helpful in understanding physical signs. It is not easy to remove lungs in their entirety, at autopsy, without tearing their enveloping membrane at one or more points. As the specimens must be filled with air to make their *x*-ray pictures valuable, such an accident must not happen. One day Dr. A. G. Athens, pathologist to St. Luke's Hospital in Duluth, performed an autopsy on a tuberculous patient who had died of an intercurrent disease. With great skill he succeeded in securing for me, intact, a pair of lungs far advanced in fibrocaseous tuberculosis. I think the film gives as clear a conception of the distribution of the lesions as did the fresh gross specimen. It certainly shows why various signs should, or should not, be found during physical examination.

#### DISCUSSION OF FILM

Looking at the film one is impressed at once with the tremendous extent of the disease and the wealth of detail. Here we have large and multiple caseation, cavitation, fibrosis and pneumonic infiltration. Some of the small areas



of caseation show dense borders indicating sufficient age to permit fibrotic changes. Others of them are lacking in these borders and undoubtedly represent the more recent pneumonic changes in which the reparative fibrotic process has not had time to develop.



Slide No. III. Lungs.

We may well picture in our mind's eye an emaciated patient with sunken chest walls and shallow breathing. Closer inspection would reveal lost movement in the apical regions of the chest, the reason to be clearly discerned in the large apical cavities. The cracked pot sound ought to be found in the apex of the right lung, unless the bronchi leading from it are occluded. In that case it would most likely be full of matter and dull to percussion. The dense shadow in the right lung below the great cavity is due in part to an area of greatly thickened pleura (as shown at autopsy) and in part to extensive caseation. Here the percussion note ought to be flat behind, where the pleura was thickened, and probably near flat in front. Elsewhere over both lungs there should be decidedly impaired resonance because of the extensive infiltration and caseation. Strangely enough in some of these advanced tuberculous cases the resonance seems not to be impaired, probably because of using heavy percussion. This elicits sound from a large area, so again tympany may influence the

quality of the note. Light percussion should be used in these cases.

Auscultation should detect cavernous or amphoric breathing over the large cavity, perhaps distant bronchial breathing or absence of breath sounds over the thickened right pleura



Slide No. IV. Patient's Chest.

behind where it touches upon the great area of caseation. Elsewhere there might be detected many and various degrees of bronchial and broncho-vesicular breathing. It is doubtful if normal vesicular breathing could be found any place in a case so advanced as this one. And what about rales? All kinds I should think, for the tuberculous process is active, and a pus-producing mixed infection must exist in the cavities and bronchi, thus causing moisture.

The functional surface of the lungs has not yet been wholly destroyed though it is greatly encroached upon by the pneumonic process. It is in the pneumonic fields and just bordering on the areas of small caseation that the fine moist râles should be heard. These areas of small caseation, whether pneumonic or fibrotic, should yield broncho-vesicular breath sounds, i.e., inspiratory sound of higher pitch than that of normal vesicular breathing with a lengthened expiratory sound. The voice and whispered sounds should be increased in proportion to the degree of consolidation and its proximity to patulous bronchi.

After seeing this film I couldn't rest until I had an opportunity to review the hospital record of the case and make comparisons. Only

that portion of the record bearing upon the pulmonary condition will be submitted.

This unhappily is not a very good film. Nevertheless it enabled the radiologist to record the following note:

"Massive bilateral pulmonary tuberculosis involving all lobes both lungs. The lesion is a mixed lesion of fibrocaceous type with more or less acute areas.

Signed by

Dr. T. G. Clement."

Observe the tremendous difference in the stories told by these two films. Even if the picture of the chest had been very superior, still the differences would be very great. The skill of the radiologist in his film reading is proven by a glance at the picture of the lungs.

Turning now to the clinical chart the following is recorded:

"Right Lung: Impaired resonance to fourth rib and sixth dorsal spine. Bronchial breathing to first and fifth dorsal spine. Medium coarse râles to third rib and seventh dorsal spine on ordinary breathing and coughing. Left Lung: Impaired resonance to fourth rib and seventh dorsal spine. Bronchial breathing to same area. Coarse râles throughout on quiet breathing and coughing."

I wonder at the paucity of findings in so rich a field. Yet we do not always easily detect all the signs above mentioned, and not without good reason. At least two factors enter into consideration. There is in this case very extensive fibrosis. Fibrosis represents lung destruction quite as certainly as does caseation.

Lung destruction means reduced elasticity and shallow breathing. Shallow breathing and inelasticity permits of plugging of small bronchi. Shallow breathing fails to distend the sticky walled alveoli. Thus the near absence of inrush and egress of air results in a feebleness or absence of auscultatory sounds. Chronic pleuritis also is a factor to be reckoned with. It is always present in some degree. Its adhesions and thickenings contribute further toward obscuring the positive pulmonary signs. This explains why the signs in advanced tuberculosis are often far more in evidence in the x-ray than upon physical examination. I think the faintness of the physical signs is in itself a prominent and noteworthy feature in the diagnosis of pulmonary tuberculosis.

The autopsy report follows. Note how closely the x-ray film pictures these findings.

"Lungs: The left shows a large cavity at the apex with a capacity of 100 c.c. and four or five smaller cavities in the lower part of the upper lobe. These all contain reddish, thin pus. There are numerous small consolidated areas, which are breaking down in the center, scattered about the lung. There are several hemorrhagic areas. The right lung, likewise, has a large cavity at the apex of about 50 c.c. capacity. There are numerous consolidated areas and cavities throughout the upper lobe. There is considerable air-containing tissue in the lower lobe. The bronchi are markedly congested and contain pus. The right pleural cavity is nearly obliterated. The left pleural cavity shows many adhesions and small areas of fibrous exudate."

# THE MANAGEMENT OF TUBERCULOSIS\*

## Part II

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THE average patient who is confronted with the diagnosis of pulmonary tuberculosis for the first time is brought to face a dilemma, of which, regardless of how he adjusts himself to the exigencies of the situation, he finds himself decorating a horn. Life has not trained him to change easily from one environmental adjustment to another. The privilege of survival has been granted to many ancestors, and finally he himself as a reward for effort and struggle. Generations of such effort and struggle have succeeded in the creation of a personality whose existence is altogether dependent upon factors that compel the individual to assert himself and to try to dominate some portion of his environment. A positive militant personality he has, and as a reward he has survival.

In the sanatorium we have attempted to provide an artificial, entirely passive, non-resistant environment, with the expectation that all personalities handicapped with the duties of presiding over the destinies of diseased bodies will adjust themselves to the environment prescribed. The difficulties encountered form the bulk of the problem in the management of tuberculosis. The cure of tuberculosis in reality becomes to a large measure a struggle between the patient and his environment. He does or eventually will feel himself physically unable to assert himself in the old environment, while towards the new one he has a strange feeling of inadequacy. The tuberculosis patient in his attempt to adjust himself does so through a series of "trials and errors," which may eventually be successful, but which in the meantime has contributed greatly to the problems underlying the management of tuberculosis.

The medical personnel can be of great assistance in aiding the patient to become a part of his new surroundings. Immediately upon entering the sanatorium the professional relationship of physician and patient must be established and carefully maintained. It does not matter whether the patient gradually passes into a domiciliary existence or rapidly becomes afebrile and con-

valesces towards an arrested state, the doctor must cherish and preserve that bond of confidence and respect that makes the one the physician and the other the patient.

The nursing profession nowhere contributes more to the relief of the pain and suffering of mankind than in caring for those ill with tuberculosis. To render adequate nursing service it is essential that a kindly professional bond be established and continued, the same as must exist between the patient and the doctor. The doctor and the nurse, and the social worker, must establish themselves on a professional basis with each patient as they are admitted. Break this relationship and the patient has neither doctor nor nurse; he is left alone in a scientific institution with the responsibility of the cure in his own hands. With a personality developed and trained for survival through struggle he often becomes his own worst enemy. The sanatorium can provide the best environment for the cure, but without the proper professional attitude of the staff towards the patient the sanatorium may in reality become a dangerous place for the patient to seek out as a haven to aid him towards convalescence.

With the development and maintenance of an efficient medical staff it is essential to have heads of departments who understand their own duties and the relationship they have towards the organization as a whole. The superintendent of the sanatorium must surround himself with loyal and intelligent lieutenants. Heads of departments must be capable of conducting their work with all other departments in the institution. Such a staff must not only be willing but they must show an interest and a desire to lend themselves to the labor and team work so essential to successful administration. In order that a staff may be held together; the various departments coordinated, it is essential that their duties and responsibilities be carefully defined. There are few methods more helpful to the employee in orienting himself and his duties than by the aid of diagrammatic charts.

At times the chart may require some revision,

\*Concluded from last month.

but this does not occur often and serves as a guide that becomes helpful to each department. Most administrative difficulties arise where duties are not or cannot be so readily visualized.

The patient who becomes employed frequently presents difficulties to the administration; this is especially true if employment is given in the same institution where the cure was taken. He frequently has difficulty in separating himself from the cure—so much so that his value as an employe is greatly diminished. Time and application often are sacrificed because of habit, and essential work becomes neglected. Another difficulty encountered by the patient employe is in his giving loyal support to the administration and the policies of the institution. While on the cure he may not have broken rules himself and he may not have interfered in any way with the successful application of the principles of the cure, yet he belonged to a specific group, a fraternity of human beings for whom the policies were made to guide and regulations to protect. It is usually considered poor sportsmanship for patients to report on one another, for one to interfere in any way with the activities of others in his group. After months of association with other patients it becomes very difficult for the patient-employe to aid the administration when both experience and training have taught him to remain passive and quiet. Once a patient, it is very difficult for some to ever cease being one, especially so far as their contact with patients in the sanatorium is concerned. It is, however, essential that the patient-employe adjust himself to the new rôle of employe and that he forget his old rôle of patient if he is to make himself of any value to the institution which once cared for him and now pays him. The patient-employe has a difficult and important adjustment to make which he usually makes unaided and unadvised, and if he fails his employment is terminated. The incident becomes an unhappy memory, his first attempt towards rehabilitation.

The employes constitute a definite corps of individuals employed for a special purpose, which cannot be realized if associations with patients are permitted. Since employes cannot associate with patients in the interest of good treatment and good administration, patients must be allowed certain privileges amongst themselves. Associations and friendships so formed should not be given too much encouragement, since

great harm may be done some patient and the purpose of the institution altogether misunderstood.

The patient must be encouraged to feel that he is an important part of the institutional program. In fact, the organization is built about his requirements of care and treatment. A chart such as we use at Ah-Gwah-Ching is of great aid in arousing the patient's interest as well as in aiding him to orient himself on the road to a cure.

Tuberculosis patients who are non-toxic and afebrile over long periods of time, but who nevertheless have considerable infiltration with positive sputum, and possibly other signs, frequently wish to break the monotony of the cure by visits away from the institution. There are few experiences more detrimental to good treatment than such visits. Such visits are often called vacations, and "vacations from the cure" they surely are. Months of time and public money are wasted within a very short time, and frequently the patient returns with extensive spreads, serious complications, to remain a bedridden case for weeks as a result of his journey.

The institutional management of tuberculosis finally resolves itself into the preparation of the patient for discharge and return to home and employment. This is the most important event that has occurred since the period of breakdown. Just how is he going to adjust himself to his new problem and who is there to aid him after leaving the sanatorium. While on the cure and convalescing in the sanatorium, has his physician prepared him for this day? Just how far will his family and associates coöperate in his readjustment to a post-sanatorium life, free of long hours, excess and strain? How well does he understand that it is not usually the job that reactivates the reclaimed tuberculous but the excesses and excitement of the social and home life that begin and end the day? How well has the sanatorium instructed the departing patient to a realization of his future physical limitations and how well has it trained him to confine his activities within such limits? One of our chief functions in the management of the tuberculous is to appraise the patient's capacity for training and to teach him the problems of rehabilitation, a problem which eventually will be his to solve. The sanatorium must be an instruction center in tuberculosis; it must advise and guide each patient separately for each has his own personal.



social, family and industrial problems to meet. Without assistance he will become beset with many difficulties and dangers. Dr. Hawes has well said:

"Those of us who are interested in stamping out tuberculosis are gradually coming to realize that no system of sanatoria, no matter how complete and elaborate as to location, number of beds, surroundings, etc., can by itself solve the tuberculosis problem. We have come to realize that the patient's stay at the sanatorium or hospital, short or long as the case may be, is but an incident in a course of treatment, the most important parts of which are before the patient enters and particularly after the patient has left the sanatorium."

"The whole question of the results of our sanatorium treatment is so intimately bound with the treatment of the patient after leaving the sanatorium—after-care work—that it is difficult, if not impossible, to tell which factor is most important, treatment in the sanatorium, or the treatment of the patient after he leaves the sanatorium."

One of the most interesting phases of the management of tuberculosis is the reaction of the patient towards the modern interpretation of the cure. Tuberculosis control and treatment is warfare in every sense of the word. Defensive warfare has never won a campaign. The modern anti-tuberculosis worker has adopted a program of aggression and offense. As long as contact and pressure is applied all along the line, positive and continuous results may be expected in favor of the aggressor. The patient entering the sanatorium was at one time expected to place himself upon a cure extending over a long period of time requiring infinite patience, without assurance or promise of end-results. Accidents and tragedies incidental to the cure could be easily ascribed to his errors of omission or commission. The patient entering the sanatorium left his hope behind or placed it in storage for possible use at some uncertain future date. Upon entering the routine

of the cure, he frequently felt that a bell had been placed upon his neck, and in this mental attitude spent his rest hours and others, philosophizing over the futility of his objectives—the convalescence of a diseased body followed by the readjustment of a handicapped personality. As a result of this long, indefinite, defensive attitude, getting little else than good fellowship, could the patient do otherwise than seek essential outlets for his pent-up emotions? The sanatorium in the past has been a school of incorrigibility for many patients who, under ordinary conditions of life, would be both normal and stable so far as the emotions are concerned. The sanatorium has often failed to reach into the patient's personality and make itself his guiding star over the rocky and uncharted road leading to a maximum convalescence, and the possibilities for an approximate social and industrial readjustment. The sanatorium no longer pursues a passive policy in the care of its patients. It now offers a positive program, and in so doing it has changed a waiting, defensive battle into one of offense.

The patient is now taken into an active partnership in this organization whose chief business is the sale of the cure. He no longer is expected to accept a program of indefinite waiting for a cure to overtake him, a cure constantly chaperoned by the fear of catastrophe. Together the patient and the sanatorium make a positive and united attack upon the disease. The institution is a partner with each patient, and they work out their plans of attack together. The management of tuberculosis has, within a few years, changed from the formality of record keeping and the housing of patients, to a scientific medical service for the community who have been or will become infected or clinically ill with pulmonary tuberculosis.

## COÖPERATION OF THE DENTIST WITH THE SURGEON IN A GENERAL PHYSICAL EXAMINATION\*

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**D**URING the last decade or two, medical and dental research and practice have demonstrated conclusively that the two professions have certain interests in common. This change to a very great extent has been brought about through the appreciation of the importance of focal infection. Definite proof exists that infection of the teeth and tissues of the oral cavity contribute largely to disturbances in other parts of the body. This fact at the outset infers that the physician must broaden his field so as to include the mouth in his search for possible points of infection.

Dentistry, therefore, should be regarded as a special branch of medicine and the dentist as a specialist should be called in consultation routinely as is the roentgologist, bacteriologist, urologist, pathologist and ophthalmologist. Present day medicine tends toward closer coöperation with the dentist.

Since Billings, Rosenow, and their co-workers called attention to the oral conditions as causative factors in disease, these conditions have assumed great importance in medicine. Up to this comparatively recent date there was little knowledge in the medical profession of the part diseases of the mouth and the teeth play in the general health of the body. It was assumed that the teeth were devoid of the capacity of self repair, that dental disorders could be remedied by mechanical means alone, that all teeth, whether healthy or diseased, could be broken off or extracted without serious effect on the welfare of the body as a whole. As a result of these assumptions the profession of medicine gave little attention to the health of the teeth. But the theory of focal infection has greatly changed this condition. It has been determined through research and observation that original foci of infection are usually found in certain tissues or organs, such as the prostate, uterus, rectum, sinuses, appendix, gallbladder, teeth and tonsils, and of these undoubtedly the teeth and tonsils rank as the greatest offenders.

Now, it is not the intention of this paper to go into the subject of focal infection. I think it can quite generally be conceded that if infection in some part of the body is causing disease in some other part, the removal of the former will often result in the restoration of health. What would perhaps be of some interest would be some suggestions as to how the two professions can coöperate, what conditions in the mouth point to the possible hidden infection, and what should the M.D. expect of the dentist when he refers a patient to him for complete oral examination.

A physician, if he were to make a general inspection of the mouth, could with a good light and mouth mirror often detect conditions which he might suspect of hiding infection, such as gold crowns, which often cover dead teeth. This is the result of a belief in the dental profession some years ago that if a tooth was to be crowned the nerve should be taken out first. Peg teeth, or porcelain crowns on posts extending into the root canals (fortunately not used so much in this day) are of course always built on devitalized teeth. Dark teeth are usually dead although some years ago a silver cement was in common use for setting inlays and bridges which in time resulted in discoloration. Silver fillings also have a tendency to darken teeth. Fistulas or gum-boils always indicate infection. Pyorrhea, although apparently offensive, can often be rendered practically harmless as a source of infection with proper treatment and home care. The above conditions can be observed in a general examination. But if thorough report is desired, we must go more into detail, and for this the case should be referred to the dentist.

An oral examination by a dentist should include: (1) a survey of the soft tissues for lesions such as cancer, mucous patches, etc.; (2) examination of the gums for pyorrhea, Vincent's angina, etc.; (3) x-ray examination of all the teeth, preferably of fourteen films, and extra-oral plates if necessary. Many times we find swelling or edema in the region of the low third molar where only plates made extra-orally can be employed successfully. The x-ray

\*Read at a joint meeting of District Dental Society and the West Central Medical Society at Morris, Minnesota, October 9, 1929.

will many times disclose conditions which we would not think of allowing to remain if we knew of their presence. A full-mouth *x*-ray examination has for some years been part of the routine physical examination at the Mayo Clinic. This is limited not only to patients that have teeth but also to edentulous cases. Even in the latter class records show that 31% have infected areas. Thermal and vitality tests are important because a tooth may be dead and still the *x*-ray not reveal such an existing condition. If there is no response to the vitality test there is no question but that the tooth is dead. Three years ago a man of forty-five was referred to me for oral examination. His symptoms were nervousness, restlessness, a very tired feeling and insomnia. Two abscessed teeth were found. These were extracted with resultant rapid recovery. Two months ago this man came in and asked to be examined, saying that he was suffering from the same symptoms that he had three years previously. The *x*-ray revealed no pathologic process but the vitality test disclosed one tooth that gave no response. In view of past experience in this case, it was decided to extract it and within two weeks he was back to normal. Transillumination often reveals pathologic conditions of the soft tissue that are not registered by the *x*-ray. Looseness of the teeth, discoloration, and pain deserve notice.

Although a written report on the results of the findings may be desired by the physician, perhaps the most satisfactory method would be to go over the findings together. It would perhaps be advisable not to decide on extraction of teeth until infections from other sources are first eliminated and then ask the question, is this tooth doing more harm than good systemically, as part of the organ of mastication, bearing in mind the lack of proper preparation of the food in the mouth may also have a vital effect on health.

Within the ranks of the dental profession there is a considerable difference of opinion as to when to extract pulpless teeth. Dr. Sterling V. Mead of Washington, D. C., who has devoted many years of study to oral pathology and its effect on health, says: "With very few exceptions I think the following teeth should be removed—1. All teeth showing periapical bone involvement. 2. All pulpless teeth in patients whose health is seriously endangered. 3. All

pulpless teeth showing marked periodontal bone resorption. 4. All pulpless teeth bordering directly on the maxillary sinuses. 5. All third molars when pulpless or causing pressure or decay in other teeth. 6. All pulpless teeth whose root formation precludes the possibility of a good root canal filling. 7. All pulpless deciduous teeth."

In regard to pulpless teeth Dr. Gardner of the Mayo Clinic says: "Extensive bacteriologic investigations at the Mayo Clinic and elsewhere have demonstrated that even pulpless teeth which show little or no evidence of infection from the roentgenologic standpoint are usually infected. The percentage is so high that all pulpless teeth must be considered potential foci of infection and should be extracted if the condition of the patient requires the elimination of all dental infection."

Now, I do not know how many dentists and physicians in this audience are working together on physical examinations but I feel that to many of us it is somewhat of a new field. Just how successfully this work will be carried on will depend to a large extent on how we as dentists measure up when the physician refers cases to us. In making our examinations we must be thorough and in our report we must state our findings and recommendations in a definite and scientific manner, thereby becoming of such valuable assistance to him that he will feel that no diagnosis is complete without our report on the conditions of the mouth. Create in the physician a wholesome feeling of confidence in our ability as diagnosticians of the oral cavity. To do this we must have the data at our fingertips and know what we are talking about and, most important, have the courage of our convictions. I think we may rest assured that the physician will be delighted to meet us more than half way and will place his confidence in the same proportion as we have demonstrated our ability. He is only too glad to leave the dental field to the dentist, but he wants to be sure to leave it in the right hands. It is admittedly a difficult program to work out and will require tact together with constant study, ingenuity and the proper spirit. But when this coöperation is attained, we will have a feeling that dentistry has been lifted another step upward and that we rank in our profession on a par with the older profession of medicine.

## THE RECOGNITION OF GLAUCOMA BY THE GENERAL PROFESSION\*

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The purpose of this paper is to call your attention to the importance of the early recognition of glaucoma. When we realize that six out of every one hundred new eye cases entering an oculist's office are those of glaucoma,<sup>23</sup> and that glaucoma causes one-fourth to one-third of blindness past middle age,<sup>8</sup> we are impressed with the importance of the condition. It is, therefore, reasonable to expect that each of us, no matter what branch of medicine he is practicing, will at some time come in contact with glaucoma. Whether or not it is recognized depends upon our knowledge of it and especially our knowledge of the earliest signs.

My object is, therefore, to emphasize two important factors: first, the importance of recognizing glaucoma early; and, second, the early manifestations of glaucoma.

The early recognition of glaucoma is of paramount importance because at this stage our treatment is most effective and little damage has been done to the eye, whereas, if treated when the disease is fully established, irreparable damage has been done to the eye and the operation which must be resorted to is ineffective in checking its progress. This statement is evidenced by the variety of treatments both operative and medical which are being utilized today. It is an established fact that in an eye which is glaucomatous the visual acuity is progressively lessened and will eventually end in blindness if not treated. It is also a fact that vision which is lost is never regained in spite of all our treatment. Expressions by the following authorities substantiate these statements: Fuchs,<sup>55</sup> one of the greatest authorities, states, "Its accurate recognition is of the greatest importance to the practitioner, the more so because here prompt and proper therapeutic interference can save everything, but a false diagnosis and improper treatment may destroy everything. Unfortunately, we still constantly get under observation many cases of glaucoma which have been incorrectly diagnosticated, and which come to the

ophthalmologist only when help is no longer possible." Thomasson<sup>16</sup> states, "To defer a diagnosis in a case of glaucoma until obvious structural changes are present would be as inexcusable as it would be in the case of pulmonary T.B.C. to wait for obvious cavity formation and for the appearance of the tubercle bacilli in the sputum before making a diagnosis. Each disease must be diagnosed in its incipient stage if we wish to prevent irreparable damage and thus render to our patients the service they have a right to expect from us."

Hence, we see that the longer the diagnosis is delayed the more vision is permanently lost and the less our chance of checking the progress of the disease.

Glaucoma is the problem of the entire profession. In everyday practice the oculist is frequently confronted with the question—Why is it that we do not see the cases early instead of in a well advanced stage, and very frequently when the eye is totally blind? He is put in the same position as the general surgeon who is asked to cure an extremist or after the patient has expired, as a dead eye from the visual standpoint to the oculist is the same as a dead patient is to the general surgeon. In order to correct this situation so that the cases will be seen earlier we must realize the fact that recognition of glaucoma is not alone the oculist's problem but the responsibility of the entire profession, especially the general practitioner. It is he who is in a position to make the early diagnosis as the patient usually comes to him because of indefinite symptoms either directly or remotely related to the eye. He should regard every person over 40 who comes to consult him because of indefinite complaints as a possible glaucoma case until the contrary is proved. Experience has shown us that if glaucoma be constantly borne in mind a considerable number of cases may be picked up which would otherwise go unrecognized until a late stage of the disease.<sup>10</sup> One is often told by medical men that they have never seen a case of glaucoma and that it is so rare that they are justified in ignor-

\*Presented before the Asbury Hospital Staff, Minneapolis, February, 1929.



ing it. This is a fallacy, for at least one patient with glaucoma presents himself to the general practitioner every few years.

It is not necessary that the physician be highly trained in ocular diagnosis to recognize glaucoma. There are some cases extremely difficult to diagnose but in most instances there is evidence enough to cause him to suspect its presence. The following statement by Wilder<sup>7</sup> is significant: "Ignorance in regard to this dreaded condition should not exist. General physicians should be impressed with the importance of the early recognition of it, and although they may do no ophthalmic work should be able to recognize it, or at least in more insidious cases to suspect it. Errors of recognition are not necessarily due to ignorance, but may result from oversight because of multifarious duties the general practitioner must assume." As stated by Derby,<sup>8</sup> "Glaucoma is the one important cause of loss of vision in which no concerted effort at conservation has been made. The physician who passes his eye cases over with a hasty inspection, or who allows himself to be beguiled into the practice of prescribing eye washes for all eye disorder, will, sooner or later, make some error fatal to vision which might have been avoided."

It is only through the coöperation with other branches of the profession that the oculist can hope to obtain glaucoma in the incipient stage.

The second point I wish to emphasize is that the early signs of glaucoma are definite. If this is so, why is it glaucoma is not recognized early? This, in my opinion, is due to the fact we are not entirely familiar with its early manifestations, and consequently the condition is overlooked. Most of our schools in teaching this subject dwell at length upon the fully developed and advanced stages of the disease and as a result our conception of the symptoms of glaucoma are those of the well established glaucoma. Very little is said about the early signs and therefore we think of the condition only when it has passed into the well established period. It is very evident that if we are to make any progress in the prevention of glaucoma it must be made along the lines of early recognition. This thought is well expressed by Batten,<sup>2</sup> who says, "Our knowledge of the premonitory symptoms of glaucoma is very limited, and has not received the attention the subject deserves."

In order to obtain a clearer picture of the

earliest manifestations of glaucoma, I wish to present the following cases. Each case has a characteristic onset and illustrates some of the ways glaucoma in its earliest stages makes its presence known. In presenting these cases certain phases have been purposely omitted for the sake of conciseness, and only the essential features relating to the onset are considered. Therefore, no attempt will be made to discuss the cases completely as the omitted features have no bearing on the present discussion.

#### Case 1.—

History: Miss E. G., aged 55, had been known all her life as a "high strung and nervous" person. For 12 years previous to her present illness she had been under medical care because of high blood pressure. She was easily upset and tired very readily. Glasses had been worn constantly for years for a high hyperopic error. Last refraction was done six years previously. Recently, because of financial reverses, she had been forced to work for her living. The work necessitated the prolonged use of her eyes and expenditure of much nervous energy. She returned home at night exhausted. One evening after a strenuous day she noticed a dull ache in the right eye. This became progressively more pronounced and she was forced to call for relief. Ophthalmoscopic examination showed well advanced atrophy and cupping of the nerves of both eyes. On questioning, it was determined that her mother had glaucoma. A diagnosis of acute congestive glaucoma was made.

This case presents a number of features which should make us at once suspicious of a glaucomatous tendency and should focus our attention on the eyes. All treatment and attention had been given to her general medical condition and the eye disregarded. The result was a hopeless case of well advanced glaucoma. The features which are significant are:

Age: In this case the age was 55, which is the age at which glaucoma is most frequently seen. It is a common observation that most cases of glaucoma occur in middle and late life, and statistics confirm this. "It is not an unwise policy to be suspicious of every eye patient 40 years of age or older, until by careful study we can declare such a patient free from glaucoma." (Peter<sup>23</sup>).

Sex: In this case the patient was a female. Although many cases are seen in males, most authorities agree that it is more commonly found in females.

Inherited tendency: If a family history of glaucoma is present we should be on our guard as there is a decided familial tendency. Familial

glaucoma, according to Lamford, is continuous in descent and is transmitted by both sexes.

**Refractive error:** The patient was highly hyperopic. It is generally accepted that to patients who have a high degree of hyperopia, we are justified in recommending periodic observation, and to report the appearance of any suspicious symptoms of glaucoma. In general it should always be borne in mind that hyperopes with small short eyes are chiefly the subjects of such tendency.

**Vascular changes:** The patient exhibited a hypertension. Arteriosclerosis is frequently present and the blood pressure is usually elevated. The study of clinical material teaches that the individual suffering from glaucoma in 90% of the cases is not alone suffering from his eyes, since he is also suffering from a general vascular affection. Charlin had studied the cardiovascular condition in 100 patients suffering from primary glaucoma, of whom 90 presented evidence of vascular disease.

**Nervous instability:** Glaucoma occurs mostly in people who are of a more or less neurotic temperament and who are under a great mental strain. It is commonly observed that grief, anxiety, and worry act as exciting causes of attacks of glaucoma. Hamberger considers glaucoma essentially an expression of some such irritating influence from the central nervous system. Bilger regards it purely as a vaso-neurosis, comparable with migraine.

**General medical condition:** There is no disease of the eye in which it is more important to take a careful account of the general physical condition and health of the patient than in glaucoma. Probably the more we learn about ocular disease the more widely will we perceive its relation to the general condition. La Grange in his latest book says that glaucoma is generally not a local disease but an ocular condition occurring in an already diseased organism. Glaucoma rarely occurs in individuals in good general health.

#### Case 2.—

**History:** Mrs. H. A. G., aged 60, had noticed for the past two years that her eyes tired very easily and because of this early fatigue she had consulted her oculist several times. Each time the reading glass was strengthened and for a time following each change was relieved. As the relief was not permanent she decided to try another doctor.

Examination revealed nothing suggestive in the external examination and the vision was normal.

Perimetric study showed a marked contraction of the visual fields, leaving only the central vision intact. Ophthalmoscopic examination showed a typical glaucomatous cup in both nerves. Other tests substantiated the diagnosis of chronic noncongestive glaucoma of long standing.

This case shows how insidious the onset of glaucoma may be. The only symptom which should have aroused suspicion was the ocular fatigue. It is also important to note that the central vision was normal even though the peripheral vision was gone. The measurement of central vision is of no value as a gauge of the progress of glaucoma until the disease has reached a late stage. Fuchs<sup>55</sup> states, "The diminution of the central vision often develops late, when the field of vision has already become very small, so that patients may carry on fine work while they are scarcely able to go about any longer. The patient often does not become aware of the existence of the disease until late." The patient's eyes tire very easily, and, thinking it is only a question of procuring stronger reading glasses, he goes to the optician and finds that he gets on much better with the new lenses, but after a time again finds increasing difficulty in reading, especially at night. This is to be regarded as a very dangerous and characteristic symptom in a person past middle age. Therefore, frequent changes of glasses, especially rapid changing of near vision or premature reading glass, should arouse our suspicion. Roemer<sup>54</sup> states, "Unusually rapid recession of the near point is noticed long before other signs of glaucoma become manifested." Priestly Smith states, "When patients between fifty and sixty years of age desire to change their reading glasses frequently or to use one stronger than is suited for their age there is reason to apprehend the onset of glaucoma." These patients often put the matter off indefinitely with the entirely satisfactory explanation to themselves that it is due to a little overuse of their eyes, and that a good night's sleep will straighten them out.

#### Case 3.—

**History:** H. J. L., aged 55, had noticed for the past year that his vision was foggy at times. Two months ago he noticed that he could not see so well with the left eye. Since this time it has progressed and recently he has noticed that the vision in the right eye was less. Being alarmed, he consulted his doctor and was told that the condition was cataract but was too early for operation. He was advised to return in six months for a check up. Being dissatisfied with this advice he decided to get an oculist's opinion.

Examination: Externally the eye was normal. Ophthalmoscopic examination showed no evidence of cataract but a definite early cupping of the disc was seen. A moderate degree of ocular hypertension was present. The diagnosis of chronic noncongestive glaucoma was made.

This case is another example of how chronic simple glaucoma is manifested. Visual failure may be the only symptom and is frequently observed for a long period before the other signs of glaucoma become manifest. Dimness of vision or foggy vision may also be noted. In describing their symptoms some patients speak of cloudiness of vision, some of seeing through a smoke, while others state that there is a fog in the atmosphere. Some patients complain that these mists are very bad in the early morning and gradually pass away as the day goes on. Others have them later in the day and attacks synchronized with periods of fatigue; but food, rest, or diversion relieve them. Very frequently this reduction in vision suggests cataract formation to the physician, and experience shows that patients have been advised that cataracts are forming and to report at a later date to the oculist for operation. This grave error can be easily avoided by the use of the ophthalmoscope which shows the lens to be clear. The following statement by de Schweinitz<sup>26</sup> is significant: "It is an inexcusable error to confound the failing vision of chronic glaucoma with cataract. Eyes have been permitted to pass into blindness and their possessors deluded with the hope that they are waiting for the ripening of a cataract." The history of gradual painless loss of vision combined with the increased density of the lens in old age, giving a slightly yellowish reflex when light is thrown in the pupil, quite naturally suggests the condition of cataract. Chronic simple glaucoma is not simple to diagnose. The tension is often not much increased, requiring a tonometer to detect the increase. The pupil is often normal in size, there is no congestion and, most misleading of all to the man who thinks of glaucoma only as acute glaucoma, there is no pain. The history is usually exactly like that of cataract—a gradual decrease in vision usually affecting one eye first and then the other. If no opacity is seen, it is practically certain that some other condition than cataract is present, and this is quite likely to be chronic simple glaucoma which requires very prompt and careful treat-

ment if any of the little sight that remains is to be saved.

Case 4.—

History: H. L. P., aged 45, had noticed for the past six months that his eyes have been slightly inflamed, more pronounced at times. Whenever the eyes were more inflamed there was a slight dull pain in the region of the eyes. His vision had not changed. It was impossible for him to use his eyes for close work because of the early fatigue and discomfort which followed. Ordinary daylight would cause discomfort. During the attacks of more pronounced congestion he could see rainbow rings around electric lights or had a misty vision. This would pass off in a short time.

Examination: The deep vessels of the globe surrounding the cornea were larger than normal. The anterior chamber was shallow and the pupils partially dilated. Their reactions were sluggish. Ophthalmoscopic examination showed a normal colored nerve head with a deep cup which did not extend to the edge of the disc and no bending of the vessels as seen in glaucoma. A venous pulsation was visible at the edge of the cup. Tension was normal at the time of the examination, but when followed for a period of several days, showed a typical glaucoma curve. Adrenalin was instilled and caused the tension to increase slightly. Perimetry studies showed a slight enlargement of the blind spot towards the macula. A diagnosis of subacute congestive glaucoma was made.

There are several features of the case which are characteristic of early glaucoma. Halos or rainbow rings around lights is a very suggestive symptom. They are usually associated with foggy vision. Mists and halos are often the earliest evidence of the disease which attracts the patient's attention and are a very delicate symptom of a rise in intra-ocular pressure. In the early stages of the disease, these phenomena are transient and rapidly come and go; but later on they assume a more permanent character. It is not uncommon to meet with glaucoma patients whose complaint is that from time to time they have seen colored rings around lights, and in whom no other evidence of glaucoma can be elicited by even the most careful examination. Most frequently we get a history of the rings appearing for short periods, when the patient is tired, and passing away when he gets a meal and rest.

Another important feature of this case was the shallow anterior chamber. This condition when present should put us on our guard. It may be a physiological condition, but it is generally admitted that when the anterior chamber is shallow an investigation is called for, especially if associated with a congested eye. Shallowing of the

anterior chamber is the most constant of the signs of glaucoma visible on simple inspection. It is due in most instances to the forward displacement of the lens. A fairly deep anterior chamber does not preclude the existence of glaucoma. A shallow chamber, on the other hand, furnishes a suspicious link in the chain of evidence which may be gathered when symptoms are carefully analyzed.

Pupillary changes likewise are important to note. A shallow chamber with a small tight pupil is the usual finding in middle aged people. But when such shallow chamber is associated with a pupil of 4 mm. or larger that reacts but little to light or accommodation in people of that age, it should immediately arrest our attention. It is important to note that in eyes suffering from, or predisposed to, glaucoma the instillation of a drop of eserine lowers the intraocular tension, while a drop of homatropine raises it. This does not occur in normal eyes and is a fact of some use in cases of doubtful diagnosis. Also, in the normal eye the instillation of adrenalin has no effect on the pupil, but there is no doubt that the Knapp adrenalin mydriasis test is positive in a very large majority of glaucoma patients. While discussing pupillary changes, it may be of interest to mention a recent observation made by Koeppel. He has claimed that glaucoma can be recognized even in what he terms the "preglaucomatous stage," by the aid of the Gullstrand slit lamp, months or a year before any other sign of the disease has appeared. He states that as a result of the morbid changes, which are taking place, pigment granules are set free; and that these wander out in the form of a fine dust, and are to be seen on the surface of the iris stroma. The observation has been both supported and contradicted. Another recent observation which is closely associated with the above discussion is the work of Uribe Troncoso. He has devised an instrument, the gonioscope, for examination of the angle of the anterior chamber. A disposition to glaucoma is often indicated from the angle of the anterior chamber and the presence of synechia. Often in early glaucoma one can find brown or black pigment spots of pigment epithelium origin in the region of Schlemm's canal.

Perimetric examination of the above case showed a characteristic finding of early glaucoma, namely, enlargement of the blind spot

towards the macula. Examination of the visual field, when suitably conducted, furnishes the most delicate and the most reliable indication of the early pressure of incipient glaucoma. The earliest changes appear within an area of 26 degrees of the center of vision. They are best determined by working at a distance of one meter on a special perimeter called the scotometer. According to Thomasson<sup>10</sup> this test is "probably the most important aid to the diagnosis of glaucoma at our command. It enables us to discover an almost infallible sign of this disease long before any subjective symptoms are constantly present." Elliot also considered it the most important procedure of all. By this method certain changes are mapped out which, although not absolutely pathognomonic, are considered very reliable evidence of the presence of glaucoma.

The optic nerve change in the above case brings up a very important point. The disc was normal in color and had a physiological cup. Beginning glaucoma may be present with a disc which has a so-called physiological cup. The physiological cup is described as a partial cupping not deeper than the lamina cribrosa, and not extending to the disc margin; also, the vessels do not emerge sharply at the margin of the disc. We must not feel that a disc having a physiological cup is free from glaucoma. Experience has shown us that a deep physiological cup may later progress into a true glaucoma cup. It is well to regard large excavated cups, especially those approaching very nearly to the temporal margin of the disc, with suspicion.

There are other changes in the disc which appear early, and are considered by good authorities to be significant, and which can be depended upon as an indication of incipient glaucoma. When a depression of the disc, however shallow, shows abruptly at the disc margin and the vessels bend sharply as they cross the margin, we have a definite sign. It is also suggested when the disc surface shows a decided slope from the cup margin to the disc margin. Hyperemia of the optic nerve or edema of the nerve head may precede the cupping. Pallor of the disc is seen occasionally very early. The optic nerve changes as an aid to early diagnosis of glaucoma, so far as the characteristic cupping is concerned, are not of much value, because by that time the disease has become firmly es-



established and has existed for some time. We must recognize the condition while the nerve head is a healthy pink and before atrophy has taken place. Recognition of the disease at this stage is of vital importance.

A venous or arterial pulsation at the edge of the disc should arouse our suspicion. In most normal eyes a slight venous pulse can be distinguished, and if the pressure within the eye rises, one of the first results is an accentuation of this venous pulse. If a further rise in pressure takes place, pulsation is communicated to the arteries as well as to the veins, and may become a very marked feature of the ophthalmoscopic picture.

The measurement of intra-ocular tension as an aid to the early diagnosis of glaucoma is of value especially when the other symptoms are doubtful. Hypertension of low degree can exist for a long time without other symptoms. It is therefore important that this be looked for in making an early diagnosis. Measurements obtained by the use of the tonometer will show slight variation from the normal. The old method of finger tonometry is only of value as a preliminary test and then only when there is considerable variation either too high or too low. But for certain limits it is valueless and may be misleading. An important point to emphasize is that a single reading is of no value unless there is a marked variation from normal, but when the change is not pronounced or normal, a series of measurements is necessary and should be recorded like a temperature chart. It is important to know that the tension should not differ materially between the two eyes and a tension which is normal in one man's eye may be pathological in the eye of another. A low tension may be measured in an eye but may be pathological for it, and so also a slightly higher than normal tension may be normal for another eye. The tension may be within normal limits in many cases of definite glaucoma. If this is so, how are we to determine when the tension is pathological? This is determined by the daily pressure curve which is typical of glaucoma. There is evidence to show that the normal eye varies but little during the day, whereas the glaucoma there is a typical variation. It is maximum in morning and minimum in the afternoon. According to Hagen<sup>23</sup> the pressure curve is a means by which diagnosis is made earlier than by any other method. The whole curve may be below normal

tension or normal all the time, yet the pressure curve show glaucoma present.

Variation in tension on dark adaptation is important in early diagnosis. Frigenbaum has shown that in a dark room, an eye with glaucoma rises in tension over 6 mm. of mercury, whereas in the normal eye a slight change is noted over a longer period.

The effect of massage on the glaucomatous eye is of practical value in diagnosis. It has been observed that massage which would lower the tension of a normal eye appreciably has comparatively little effect upon a glaucomatous eye. According to Thebert this reaction is important in early diagnosis.

It may be of interest to mention a test which, although in the experimental stages, will eventually prove to be of value in the early diagnosis of glaucoma. This is the alteration in light sense. There is good reason to believe that a slight failure in light sense is one of the earliest indications of the onset of glaucoma. In cases of incipient glaucoma it is believed a rise in light minimum curve is often the earliest sign. It has been demonstrated that after glaucoma has developed in one eye only, the second eye, although entirely free from glaucoma so far as usual signs and symptoms are concerned, may foretell its own development of the same disease by showing changes in the light sense, a slowing of dark adaptation, and an increase in the light minimum.

Another test which may prove to be valuable is the increased permeability of the capillaries, a diagnostic sign of glaucoma which has been suggested by Thiel. Sodium fluorescein is given the patient by mouth, and its appearance is looked for in the aqueous humor by means of the slit-lamp. In the normal eye it is not detected, but in iritis and glaucoma this writer claims that a fluorescence is visible in the pupil. Although this work is new, it suggests the possibility of a valuable procedure.

#### Case 5.—

History: Mrs. J. B., aged 65, stated that for the past two years she had noticed that her vision was "failing." This was more noticeable at times, and during these periods the vision was so greatly reduced that things looked foggy. On one occasion she was totally blind for a few minutes. During these attacks of reduced vision she noticed colored rings around electric bulbs. At times a dull ache was present in and about her eyes and the eyeballs were congested. Between

attacks her eyes felt almost normal except for early fatigue. She has been under a doctor's care for the past two years because of high blood pressure. The day previous to consulting me she had a severe headache which was centered around the right eye. This became progressively worse and she was confined to bed. She became nauseated and vomited. The vision rapidly diminished and in a few hours she could not see with the eye. Morphine did not relieve the pain.

**Examination:** The eye was greatly congested. The lids were swollen and the conjunctiva of the globe was chemotic and bluish in appearance (due to venous engorgement). The cornea was hazy and the anterior chamber obliterated. The pupil was irregularly dilated and did not respond to stimulation. A greenish reflex was present from the pupil, and a view of the fundus was impossible. The tension was stony hard, but was relieved by constricting the pupil with eserine. This caused the symptoms to rapidly subside. A later examination showed a marked cupping of the disc, typical of glaucoma. The vision was practically nil. The other eye showed a similar involvement but to a less degree. A diagnosis of acute congestive glaucoma was made.

This case brings up the question of differential diagnosis. Inflammation in an eye should be carefully examined before it is prescribed for and a differential diagnosis made. We should have in mind three important eye diseases in every inflamed eye we examine: conjunctivitis, iritis, and inflammatory glaucoma. No treatment whatever should be given unless we feel sure of our differential diagnosis, for the treatment of these three diseases is radically different. The treatment that will cure one will render the eye blind in the other. A simple differentiation is made by observing the following points.

**Congestion:** Conjunctivitis presents large blood vessels superficially located in the covering of the eyeball itself. These vessels are smallest at the cornea and grow larger and more tortuous as they reach the fold or the cul-de-sac. In acute glaucoma the eye assumes a purplish hue on account of the venous stasis. In acute iritis there is more of a diffused pink color surrounding the limbus and extending over the globe.

**Pain:** In many cases of iritis the pain is just as severe and these cases are much more common than those of acute glaucoma, a relatively rare disease. However, the pain is much more acute in its character, much more rapid in its development and much more extensive in its distribution in acute congestive glaucoma. It is frequently mistaken for a severe neuralgia.

**Discharge:** This is usually present in a conjunctivitis and absent in iritis and glaucoma.

**Age:** Conjunctivitis is common at all ages. Glaucoma seldom occurs before the fortieth year, and iritis is rarely seen in childhood.

**Tension:** In acute glaucoma a careful palpation through the closed lids will often show a marked hardness of the affected eye as compared with the other eye. In iritis, however, where the lids were swollen and the eye is exquisitely sensitive, it is often impossible to press on it hard enough to tell whether it is hard or soft. The tension is increased in glaucoma and normal or even decreased in iritis.

**Pupil:** The pupil in both cases is relatively immobile, but is especially so in acute glaucoma, and in this condition is widely dilated, while in acute iritis the pupil is inactive but contracted, unless a mydriatic has been used, in which case the iris will show adhesions to the anterior capsule of the lens, giving an irregular outline to the margins of the pupils.

**Anterior chamber:** The iris is pushed forward in glaucoma, due to the intra-ocular pressure, producing a shallow anterior chamber; in iritis the anterior chamber is normal in depth, or if changed is deeper than normal.

Case 5 also brings up the question of ocular pain, which in this instance was severe. Aside from the visual changes in glaucoma, perhaps pain is the principal symptom that causes the patient to come to his physician for relief. The neuralgic pains of glaucoma may vary from a peculiar sense of discomfort to a severe pain of characteristic nature. Marked pain does not occur early in simple glaucoma, but slightly aching or asthenopic discomfort may be the first symptom. A simple glaucoma may run its whole course without one moment of pain in the eye. Again, the early slight attacks of subacute glaucoma may be attended only by mild feelings of discomfort or of ocular pressure. On the other hand, the acute disease is marked by great suffering. The trouble is not always referred to the eye. The patient and even his medical advisor may make the mistake of thinking that the cause of the trouble is in the teeth, the ears, or nose, since the "neuralgia" complained of appears to start from one of these organs.

The headaches, which make us suspicious of glaucoma, are headaches in people past middle age when all refractive errors have been cor-

rected; or headaches in elderly patients associated with vomiting.

## CONCLUSIONS

Our greatest hope in arresting glaucoma lies in its early recognition because at this time its response to treatment is most satisfactory. Glaucoma is the problem of the entire profession and it is only through the coöperation of all branches of the profession that we can hope to obtain glaucoma at an early stage.

Glaucoma can be recognized in its earliest stage if we are on the lookout for it and are familiar with its early manifestations. The five cases presented emphasize some of these. Case No. 1 brings out the importance of predisposing factors. Case No. 2 shows how insidious the onset of glaucoma may be, there being no external changes or loss of vision. The only symptom was early ocular fatigue. It also shows how the reading vision may be perfect and the eye practically blind. Case 3 illustrates how visual failure may cause us to consider cataract formation and the eye slowly pass into blindness while waiting for the cataract to mature. Case 4 emphasizes several points of importance: the diagnostic value of halo vision, anterior chamber, pupillary, optic nerve and tension changes. It also shows the value of the perimeter as a means of diagnosis. Case 5 emphasizes the importance of distinguishing between acute conjunctivitis, iritis, and acute glaucoma.

Although certain cases require extensive equipment and much detailed study before a diagnosis of glaucoma can be made, the great percentage of cases can be diagnosed or at least suspected by much less study and without the aid of special equipment. The essential point to remember is that its early recognition means everything and that it is not a rare mysterious disease which interests only the oculist, but rather a fairly common condition which we all see and which we can all recognize if we are on the lookout and know its symptoms.

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## BIBLIOGRAPHY

- Atkinson, D. T.: *New Orleans Med. and Surg. Jour.*, 73:50, 1920.
- Batten, R. D.: *Trans. Ophth. Soc. United Kingdom*, 40:293, 1921.
- Butler: *Trans. Ophth. Soc. United Kingdom*, 41:419, 1921.
- Haden, H. C.: *Texas State Jour. Med.*, 18:24, 1922.
- Haden, H. C.: *Texas State Journal Med.*, 50:556, 1921.
- Kearney, J. A.: *New York Med. Jour.*, 110:11.
- Wilder, W. H.: *Penn. Med. Jour.*, 24:367, 1921.
- Derby: *Am. Jour. Oph.*, 178 (March), 1927.
- Knapp: *Arch. Oph.*, 50:536, 1921.
- Matson, E. A.: *Med. Jour. Australia*, 1:80, 1925.
- Elliot, R. H.: *Jour. Ophth., Otol. and Laryngol.*, 27:118, 1923.
- McGuire, H. H.: *Virginia Med. Month.*, 48:532, 1921-2.
- Jennings, C. W.: *Atlantic Med. Jour.*, 27:510, 1924.
- Dotson, W. S.: *Jour. Tenn. Med. Assn.*, 1925, 18:99, 1925.
- Weih, E. P.: *Jour. Iowa State Med. Soc.*, 15:240, 1925.
- Thomasson, A. H.: *New York State Jour. Med.*, 28:4, 1928. Also *Arch. Ophthal. N. Y.*, 1928.
- Lewis, W. W.: *Minn. Med.*, 7:500, 1924.
- Posey, W. C.: *Arch. Ophth.*, 49:293, 1924.
- Elliot, R. H.: *Am. Jour. Ophth.*, 5:811, 1922.
- Allison, R. S.: *Brit. Med. Jour.*, 2:1185, 1927.
- Davies, D. L.: *Lancet*, 1:699, 1928.
- Thomasson, A. H.: *Arch. Ophth., N. Y.*, 56:319, 1927.
- Peter, L. C.: *West Virg. M. N., Wheeling*, 1927, xxiii, 530-533.
- Wells, D. W.: *Boston Med. and Surg. Jour.*, 140:282, 1924.
- Elliot, R. H.: *Brit. Med. Jour.*, 2:108, 1920, and 2:279, 1920.
- Fuchs, A.: *Am. Jour. Ophth.*, 7:425, 1924.
- Elliot, R. H.: *Am. Jour. Ophth.*, 6:1, 1923.
- Fuchs, A.: *Brit. Jour. Ophth.*, 12:65, 1928.
- Albright, C. C.: *Northwest Med.*, 25:496, 1926.
- Bailey, T. L.: *Kentucky Med. Jour.*, 25:209, 1927.
- Elliot, R. H.: *Internat. Cong. Ophthalmol.*, 1:405, 1920.
- Gifford, S. R.: *Nebraska Med. Jour.*, 11:222, 1926.
- Hagen, S.: *Acta Ophth.*, 2:199, 1924.
- Gradle, H.: *Med. Jour.*, liii, 53:430, 1928.
- Lewis, W. W.: *Am. Jour. Ophth.*, 9:836, 1926.
- McReynolds, J. O.: *Jour. Oklahoma Med. Assn.*, 20:56, 1927; *Kentucky Med. Jour.*, 25:109, 1927.
- McReynolds, J. O.: *Texas State Jour. Med.*, 21:533, 1926.
- Snyder, W. H.: *Ohio State Med. Jour.*, 19:642, 1923.
- Stanford, J. B.: *New Orleans Med. and Surg. Jour.*, 79:425, 1926.
- Wood, H.: *South. Med. Jour.*, 24:1921.
- Wilder, W. H.: *Ill. Med. Jour.*, 55 (Jan.) 1929.
- Derby: *New England Jour. Med.*, 199, 1928.
- Curdy: *Am. Jour. Ophth.*, Vol. 2 (Aug.), 1928.
- Thompson, H. H.: *Trans. Ophth. Soc. of United Kingdom*, 40:334, 1920.

45. Batten, R. D.: *Trans. Ophth. Soc. of United Kingdom*, 40:343, 1920.
  46. Dayne, P. G.: *Trans. Ophth. Soc. of United Kingdom*, 41:281, 1921.
  - 46a. Butler, T. H.: *Trans. Ophth. Soc. of United Kingdom*, 41:418, 1921.
  47. Atkinson, D. T.: *New Orleans Med. and Surg. Jour.*, 43:50, 1920.
  48. Wilder, W. H.: *Penn. Med. Jour.*, 24:367, 1921.
  49. Haden: *Texas State Jour. Med.*, 22:326, 1926.
  50. Haden: *Texas State Jour. Med.*, 18, 1922.
  51. Kearney, J. A.: *New York Med. Jour.*, 110:11, 1919.
  52. Knapp, A.: *Arch. Ophth.*, 50:556, 1921.
  53. Derby: *Am. Jour. Ophth.*, 10:198 (March), 1927.
  54. Roemer: *Text Book of Ophthalmology*.
  55. Fuchs: *Text Book of Ophthalmology*.
  56. de Schweinitz: *Text Book of Ophthalmology*.
  57. Elliot: *Glaucoma*.
  58. Duke, Elder: *Recent Advances in Ophthalmology*, 1919.
  59. Matison, E. A.: *Medical Jour. of Australia* (Jan.), 1925.
  60. Chevalloreau, A.: *Par.*, p. 247, 1924.
  61. Elliot: *Jour. Ophth., Otol. and Laryn.*, 27:118.
  62. Matison: *Med. Jour. Australia*, p. 80 (Jan.), 1925.
  63. Derby, G. S.: *Am. Jour. Ophth.*, p. 178 (March), 1927.
  64. Hadel, H. C.: *Texas State Jour. Med.*, 22:326, 1926.
  65. Knapp, A.: *Arch. Ophth.*, 50:556, 1921.
  - 65a. Knapp, A.: *Arch. Ophth.*, 50:556, 1921; *Trans. Amer. Ophth. Soc.*, 1921.
  66. Schoenberg, M. J.: *Arch. Ophth.*, 54:282, 1925.
  67. Hamberger, C.: *Arch. Ophth.*, 55:533, 1926.
  68. Knapp, A.: *Trans. Ophth. Soc.*, 1925.
  69. Waite, Derby, and Kirk: *Trans. Ophth. Soc., United Kingdom*, 45:301, 1925; *Ophth. Year Book*, 23:117, 1927.
  70. Thiel, R.: *Arch. f. Augenh.*, 96:331, 1925; *Ophth. Year Book*, 22:120, 1926.
  71. de Schweinitz and Baer: *Am. Jour. Ophth.*, 9:619, 1926.
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## MUTATION OF STREPTOCOCCI: REPORT OF A PROBABLE CASE\*

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ROSENOW<sup>3,4</sup> (1913 to 1915) reported studies on the transmutation of streptococci and pneumococci. He demonstrated that hemolytic streptococci could be changed to streptococci of the viridans or mucosus varieties, and these, in turn, into pneumococci. The process also could be reversed. All this seemed dependent on the selection of suitable strains and appropriate methods of culturing, and, among the latter, gradients of oxygen tension apparently played an important part.

The transformation of some of the strains was found to be complete by every test known. This was proved by morphology, the presence of capsule, the fermentative powers, the solubility or insolubility in bile and in solution of sodium chloride, the behavior toward the respective broth cultures, the specific immunity as manifested by the production of opsonins and by agglutination with antipneumococcus and anti-streptococcus serums and the pathogenic powers. Moreover, when the transformation was complete, the acquired properties became fixed, and the strains then behaved as did those obtained from the usual sources. To change the organisms again it was necessary to place them under stress or strain. The underlying conditions which called forth changes were favorable conditions for luxuriant growth and subsequent unfavorable conditions. New or latent energies which were previously not manifest were called forth and tended to persist. There was no question about working with mixed cultures because of each main variety of organism single organisms were obtained and so the changes observed were not due to so-called "mass selection" but to actual changes under the influence of changed environment. If such a condition could prevail under artificial growth it seemed feasible that it would also occur in vivo. Rosenow<sup>3</sup> observed apparent mutations in animals and almost exclusively in closed cavities, such as the joints, the

pericardium, and in the pleural cavity in patients recovering from pneumonia caused by the pneumococcus. These mutations took place mostly when the tissues of the host were getting the upper hand and the organisms were being destroyed. He spoke of mutations in vitro as "retrogressive" and those in animals as "progressive" because, in the former, virulence, fermentative powers, and other evidences of a vigorous vegetative life were diminished; in the latter they were usually increased.

The bearing that these observations might have on organisms in distant foci of infection seems apparent. Foci of infection might be places through which bacteria not only gained entrance to the human body but also places where conditions are favorable for them to acquire the properties which give them affinities for various structures.

That these observations of Rosenow have a practical application is strongly suggested by some types of disease in which foci seem to play a part in the progress of the infection. Undoubtedly, many similar instances could be cited, but the case here reported illustrates numerous features supporting the hypothesis of mutation of streptococci. If there still remains disapproval of the term "mutation," there can be no possible objection to the term "dissociation," as used by Hadly to designate the close relationship of various streptococci and the probable ability of them to change from one to the other as they pass through various phases of perhaps a life cycle.

### REPORT OF CASE

A married woman, aged twenty-five years, came to the clinic, September 10, 1928, with a history of intermittent bloody dysentery of five years' duration. The first attack had begun about five years before with frequent movements of the bowel, between ten and twelve in twenty-four hours at the maximum. The attack had subsided in a month. After a remission of several months, the trouble had recurred. The second time it had been more severe and the number of stools had averaged ten to twenty-five in each twenty-four hours and had contained much blood, mucus and pus.

\*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the Central Society for Clinical Research, Chicago, Illinois, November 22, 1929.

This attack had lasted through the summer and until fall, when her condition had become somewhat improved under local irrigations and limitation of diet. Since then there had been improvement each winter and an exacerbation each summer. The patient never had been entirely free from symptoms since the first attack. The last attack had begun about six months before she came to the clinic and had become pro-

genologic examination of the colon showed evidence of chronic ulcerative colitis of the entire colon with deep ulceration (Fig. 1). Proctoscopic examination was done, September 11. The mucosa of the rectum and sigmoid was glazed and bled with slight trauma. There was extensive secondary ulceration; the lumen was contracted to about half its usual diameter. Activity of the disease was graded 2, and the diagnosis



Fig. 1. Colon after barium enema of patient with extensive subacute ulcerative colitis.



Fig. 2. Streptococci in long chains isolated by blood culture.

gressively worse until her admission. In the course of this time she had lost about 30 pounds in weight.

On admission the patient's weight was 82.5 pounds. Her blood pressures were 115 systolic and 70 diastolic, her pulse rate was 94 beats for each minute and her temperature 98.4° F. Her tongue was thickly coated. She seemed fairly well nourished but was of rather slight stature. There was generalized abdominal soreness, seemingly more marked along the line of the colon. The anal sphincter was very spastic and the rectum imparted a granular feeling to the finger. At no time during her stay in the hospital was anemia very marked; the lowest estimate of hemoglobin was 65 per cent by the Dare method and the erythrocyte count was 3,310,000 for each cubic millimeter. There was persistent, mild leukocytosis, ranging between 8,800 and 14,100 cells for each cubic millimeter. Urinalysis gave essentially negative results. The Wassermann reaction of the blood was negative. Early in the disease there was a report of someone having found amebæ, but at this time repeated examinations of stool failed to reveal parasites, ova or acid-fast bacilli. The roentgenogram of the thorax gave negative results. The roent-

was chronic ulcerative colitis. The diplostreptococcus so commonly found in these cases was isolated from the ulcers in the rectum. Other laboratory data were of no diagnostic importance at this time.

Treatment with specific immune serum was begun. At this time the patient was having between twelve and fifteen rectal discharges, mixed with blood and pus, every twenty-four hours. Improvement was striking until September 25, when she had a general feeling of malaise, a slight chill and an elevation of temperature to a maximum of 103.5° F. The maximal temperature prior to this, in the two weeks she had been in the hospital, had been 101° F. There was marked tenderness over the descending colon and sigmoid, and the question of perforation was considered. Palliative measures were applied and within forty-eight hours the condition subsided. Improvement again continued until October 10, when an acute, periapical dental abscess developed, and, coincident with this, occurred the first symptoms of arthritis. The arthritis progressed rapidly, and in four days many of the joints, including the fingers, ankles, knees and elbows, were acutely tender and swollen. In the lower jaw was a typical "gum boil," which was tender and sore. By October 23 this had subsided sufficiently to allow of removal of

the offending tooth, and following its removal the arthritis subsided promptly. During the weeks of the arthritic difficulty, the colitis remained at a standstill. Large doses of the salicylates were employed in the treatment of the arthritis.

October 25, numerous red, elevated, tender nodules appeared in the subcutaneous tissues of the lower extremities, and two on the right arm. Associated with

subsided somewhat and the administration of specific ulcerative colitis serum was again begun.

December 14, after several days during which the patient had not felt particularly well, there was a rise in temperature to 102° F. At this time, on blood culture, an indifferent type of streptococcus, in short chains, was obtained (Fig. 2). When these organisms were injected into rabbits, lesions developed in the



Fig. 3. Large lanceolate diplococci within chains of smaller streptococci seen in smears from blood culture.

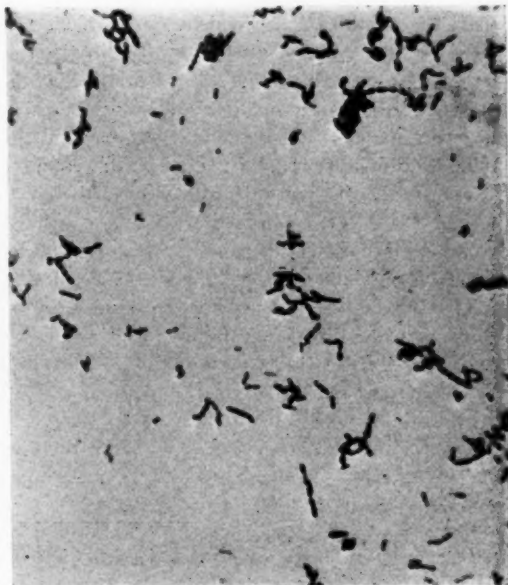


Fig. 4. Diplococci seen in smears from blood culture, after several subcultures in glucose brain broth. The predominating organisms here are streptococci in short chains.

this occurred a rise in temperature to 102.5° F. In consultation with a dermatologist, a diagnosis of erythema nodosum was made. With the subsidence of the arthritis, the nodules subsided, and also the colitis, so that, by October 31, the patient was having two formed stools daily. At this time, and on several previous examinations, cardiac involvement had not been noted.

December 4, tonsillectomy was performed, and in the tonsillar abscesses discrete diplococci and short chains of diplococci were found and were injected intravenously into rabbits. Acute polyarthritis and acute ulcerative colitis developed in the rabbits. The discrete diplococcus found in the tonsillar abscesses corresponded in appearance to that of the organism which had been obtained from the rectal lesions, as it appeared when freshly isolated. The patient made a fairly uneventful postoperative convalescence, but within seven days after tonsillectomy an acute exacerbation of the polyarthritis occurred, with tender, swollen joints; however, there was only a slight exacerbation of the colitis in the form of an increase in the number of stools to four and five in twenty-four hours. The stools were streaked slightly with blood. Under heavy doses of salicylates the swelling in the joints

joints. This general upset lasted only three days, following which came two weeks of marked improvement, until January 3, when a sudden chill, and a temperature of 105.5° F. developed. Blood culture at this time resulted in growth of a diplostreptococcus, morphologically much larger than the first organism obtained on blood culture and resembling more the organisms of chronic ulcerative colitis. Intravenous injection of this organism into rabbits again was followed by lesions of the joints, but also by hemorrhages into the mucous membrane of the colon. Treatment with specific serum was continued, and improvement was progressive, so that by February 1 the patient was dismissed from observation. She was averaging four bowel movements in twenty-four hours, without admixture with blood, the arthritis and the erythema nodosum had subsided completely and she was directed to continue administration of the specific vaccine at home. In a recent letter she stated that improvement has continued.

#### COMMENT

The interesting features in the bacteriology in this case are the following: An organism like the

diplostreptococcus that was isolated from the ulcers in the rectum was isolated also from the abscesses in the tonsils. Two dissimilar organisms, both of the streptococcus group, were isolated by blood culture. The culture made from the dental abscess became contaminated, but clinical symptoms suggested relationship between this organism and that causing the arthritis. Repeated subculture of the organism isolated from the blood stream resulted in the isolation of an organism in all essentials like the organism of ulcerative colitis and also like streptococcus in short chains. In the same culture tube would appear short chains of rounded streptococci, with pairs of diplococci in the chain (Figs. 3 and 4). When the organism isolated from the blood was injected intravenously, lesions of the joints and of the colon developed. A striking feature is the isolation of similar organisms from the blood, from the abscesses of tonsils and from the ulcers in the rectum, and the temporary exacerbation of the various clinical conditions when the foci were eradicated.

One might speculate extensively about this hu-

man laboratory. The facts suggest many possibilities. The relationship of severe subacute ulcerative colitis, polyarthritis, and erythema nodosum has been described previously.<sup>1</sup> The opportunity of following these conditions through the various phases rarely presents itself. Information along these lines is usually gleaned from the history. This, and the bacteriologic data that accompanied each new development, must be taken seriously and applied, perhaps, in a consideration of disease on which distant foci may have a bearing.

#### BIBLIOGRAPHY

1. Bargen, J. A.: Complications and sequelæ of chronic ulcerative colitis. *Ann. Int. Med.*, 1929, iii, 335-352.
2. Rosenow, E. C.: A bacteriological and cellular study of the lung exudate during life in lobar pneumonia. *Jour. Infect. Dis.*, 1911, viii, 500-503.
3. Rosenow, E. C.: Studies on the transmutation of pneumococci and streptococci. *Tr. Chicago Path. Soc.*, 1913-1915, ix, 61-63.
4. Rosenow, E. C.: Complications and sequelæ of chronic ulcerative colitis. *Ann. Int. Med.*, 1929.



## GASTROINTESTINAL SYMPTOMS OCCURRING WITH UPPER RESPIRATORY INFECTIONS IN INFANCY AND CHILDHOOD\*

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GASTROINTESTINAL symptoms are so often present in children having acute upper respiratory infections that it seems worth while to discuss them briefly. Often the intestinal symptoms are much more outstanding than those of the respiratory tract, so much so that one is apt to make a mistake in diagnosis unless on his guard. The intestinal symptoms frequently are so outstanding that they are the reason for calling the physician and it is only when a complete physical examination is made that the real cause of the trouble is found. It is to emphasize the necessity of making a thorough and complete examination that I wish to discuss the various intestinal symptoms which may occur with upper respiratory infections.

Any of the acute upper respiratory infections, from a simple head cold to the severest forms of influenza or pneumonia, may be accompanied by intestinal symptoms varying from those of a mild degree up to those of an alarming nature. In this paper we shall include under the term "acute upper respiratory infections," simple head colds, tonsillitis, pharyngitis, laryngitis, bronchitis, la grippe, influenza and pneumonia.

The intestinal symptoms which may accompany any one of these infections are varied. We often see any of the following: anorexia, vomiting, diarrhea, constipation, flatulence, acute abdominal pain, mucus in the stool, abdominal tenderness or tenesmus. Finkelstein and Czerny called attention to the prevalence of intestinal disturbance caused by parenteral infections, but I think that many of us fail to recognize how very frequently these disturbances occur and how severe the intestinal manifestations may be.

It is not my intention to discuss in this paper intestinal intoxication or decomposition (athrepsia) even though both of these conditions often result directly from acute upper respiratory infections. It would be impossible to adequately handle these conditions in a paper of this kind.

Instead, the discussion will be limited to the type of intestinal disturbance which we all meet day after day in dealing with children.

In one group we will place infants under one year. It is in this group that one sees the most marked intestinal disturbances. It is almost always true that in babies having even the mildest head cold, the intestinal tract is upset in some way. Perhaps the most common symptom is anorexia. This may be due to two factors: first, lack of appetite due to absorption of toxin; and, second, the mechanical difficulty of nursing properly because of mucus in the nose. Most small babies who have a cold refuse to eat properly because of these two reasons. I shall not attempt to discuss the treatment of acute colds except to emphasize the importance of elevating the head of the baby so as to prevent gagging and choking and also to recommend the use of some type of nasal drop to help the breathing. Ephedrine solutions have usually proved the most satisfactory in my experience.

Vomiting is perhaps the next most common symptom and this may vary from simple regurgitation to marked nausea, with continued retching. In infants there does not seem to be any effective means of stopping this except by trying to cure the infection itself. Care should be taken not to force food. There is considerable danger that in nursing babies the mother's milk supply may diminish because of inadequate emptying of the breasts. Expression should be used to prevent this.

Diarrhea very commonly occurs in infants who have an upper respiratory infection. Usually the baby has only a moderate increase in the number of stools, and there is no serious loss of fluid or mineral salts. In these mild cases the stools usually contain mucus and they may be moderately loose. It is ordinarily unnecessary to do anything in this type of case but treat the upper respiratory infection, as the diarrhea is not severe enough to affect the baby, and it disappears as soon as the respiratory infection is cleared up.

\*Read before the Upper Mississippi Medical Society, Long Prairie, Minn., Nov. 7, 1929.

Occasionally, however, one sees a baby suffering with an upper respiratory infection, in which there are frequent, watery stools and in these cases evidence of severe fluid loss soon appears. In such cases the administration of protein milk will usually control the diarrhea. This may be given either alone or the protein powder may be given diluted with breast milk, water, or a simple milk mixture. One teaspoonful of the powder given before each feeding is usually adequate. If the baby shows evidence of serious dehydration, subcutaneous fluids should be given.

Often infants with upper respiratory infections have colicky pains caused by gas or abdominal distension. Relief can be given by the use of enemas.

Older children also have gastrointestinal disturbances with upper respiratory infections, but the symptoms are usually not so marked in the milder infections, such as head colds, as in infancy. Anorexia is often present even in simple colds, but vomiting, diarrhea and abdominal pain usually do not occur except in the severer forms of infection such as tonsillitis, pharyngitis, bronchitis, la grippe, influenza or pneumonia. In these more severe infections the intestinal symptoms may be marked. Vomiting very commonly occurs at the onset of any of these infections. It may be severe, but usually lasts only a short time. Aside from the treatment of the infection, no treatment is required for the vomiting except the withholding of food until the nausea disappears. The most troublesome intestinal symptom which older children develop in these infections is acute abdominal pain.

Brenneman called our attention to the frequency of acute abdominal pain in tonsillitis. It occurs not only in tonsillitis but also in other upper respiratory infections. The pain may be severe, and, unless one is on his guard, may lead to a false diagnosis of appendicitis. This acute abdominal pain is, as we all know, very frequently present in pneumonia, particularly of the lobar type. Careful physical examination will usually make it possible to rule out appendicitis. Enemas and application of heat will ordinarily relieve the pain, except in cases of pneumonia. Here usually there is referred pleuritic pain, in which case strapping of the affected side will often give relief.

Diarrhea, although occasionally present in older children suffering with upper respiratory in-

fections, is seldom severe enough to be a disturbing element. One sometimes sees a child with upper respiratory infection who becomes severely constipated. Simple cathartics and enemas will relieve the condition until the respiratory infection subsides and then the condition will correct itself. Abdominal distension, flatulence or tenesmus may occur, but respond to simple methods of treatment and disappear with the upper respiratory infection.

We wish finally to speak of the type of gastrointestinal disturbance so prevalent among children in the last few years, commonly called "intestinal flu," "stomach flu," "intestinal grippe" or probably more correctly called epidemic upper respiratory infection with gastrointestinal symptoms. We realize that probably none of these names is perfectly correct and that at the present time any intestinal disturbance which a child may have, from the simplest condition to the most severe, is often diagnosed "intestinal flu." Certainly this term is very promiscuously used and in fact many grave and fatal errors in diagnosis have been made because of the increasing tendency to diagnose all intestinal disturbances as intestinal influenza, regardless of the true etiology or pathology of the particular condition. In this paper we shall speak of that condition having certain definite characteristics, which to us make it a definite entity. Whatever may be the organism or other etiological factor, it seems to us that we can recognize a definite clinical picture, which for want of a better term we shall call epidemic upper respiratory infection with marked gastrointestinal symptoms. The clinical picture varies in different children but there are certain characteristic symptoms and findings which make it possible to make a definite diagnosis. The outstanding symptoms are gastrointestinal. Usually the onset is sudden, but in some cases the marked intestinal symptoms are preceded for one or two days by an ordinary head cold. The usual story, however, is that a child is taken suddenly with severe vomiting attacks. Unlike the vomiting which follows a dietary debauch of childhood and is severe for a short time, but stops as soon as the stomach is empty, the vomiting in this condition persists. The child vomits continuously and finally continues to retch when only a watery fluid is thrown up. There is rather marked prostration accompanying the nausea. The vomiting may

last from a few hours to several days, and in those cases where it persists for two or three days marked dehydration and symptoms of acidosis may appear. In other cases diarrhea may be the only intestinal symptom present, but in most cases in which diarrhea occurs it is present along with continued vomiting. The diarrhea is rather definite in character, the stools being loose, foul and almost always light in color. These colorless chalky stools are almost diagnostic of the condition. There may be a high temperature (103-104) present in the condition under discussion, but usually the temperature is of a low grade (100-101). Abdominal pain of a cramp-like and intermittent nature is very frequently present and this may persist long after the vomiting and diarrhea have stopped. The pain is generalized and there is little or no abdominal tenderness present, and no muscle spasm.

As stated above, upper respiratory symptoms may be present in the form of nasal discharge, and in some cases there is a slight hacking cough and occasionally the child may complain of a sore throat, but in the great majority of cases there are no symptoms, either objective or subjective, to lead one to suspect the presence of an upper respiratory infection. It is only on physical examination that one realizes that he is dealing with an infection of the upper respiratory tract. Invariably when the throat is examined one sees increased reddening of the pharynx, most marked around the anterior pillars. One also notices an engorgement of the blood vessels of the posterior pharynx. The tonsils (if present), although reddened, are usually not swollen and there is very seldom any exudate nor is there an increased amount of mucus in the throat. Occasionally one may hear evidences of bronchitis and in many instances otitis media with reddened ear drums may occur as a complication, but in the vast majority of children the only physical findings in the respiratory tract are the reddened pillars and injected pharynx.

In those cases where a leukocyte count is made one almost invariably finds a slight leukopenia.

Although the acute intestinal symptoms usually subside in from a few hours to two or three days, many children do not completely recover from the infection. Time and again a child is brought to the physician with the complaint that following one of these infections the child does not seem to return to his normal health. The

mother says that the child won't eat well, tires easily, is irritable and that there are occasional days when there is vomiting, diarrhea or constipation. Also many of the children continue to complain of abdominal cramps. The child does not seem to be really sick, but drags around and has more or less vague intestinal and generalized symptoms that keep him from feeling perfectly well. This state of affairs may continue for only a few days after the acute attacks, but in some children it lasts for weeks.

In discussing the treatment of this epidemic form of upper respiratory infection with intestinal symptoms, I am simply going to describe the form of treatment that has worked out most successfully in my experience. I know that there are other methods of treatment which have proved successful with other men, but the methods I shall describe have proved most satisfactory in the cases that have been under my care. When the child shows the first signs of vomiting or diarrhea he should be put to bed and kept absolutely quiet. The more he moves around the longer the intestinal symptoms seem to last. This is particularly true with those who are vomiting. They should be kept in bed until all temperature, vomiting or diarrhea have stopped for at least twenty-four hours. As soon as the child or infant first shows signs of nausea he is given French Vichy water in small amounts ( $\frac{1}{2}$  to 1 ounce), whenever he wants water. No regular water is given until he has been free from nausea for at least eight hours. The most effective method that I have found to stop the nausea has been the administration of French Vichy water in place of regular water.

No food is given to those children who are vomiting until there has been an interval of at least four hours with no vomiting or retching. In the children who are old enough to ask for food, nothing is given until they themselves demand it. In infants, if there has been an interval of four hours during which there has been no evidence of nausea, they are offered breast milk or their regular milk mixture, but if they do not want it, no effort whatever is made to force them. If they are old enough to get cereal, this is offered before milk. In the older children nothing but gelatin or Jello, dry toast and soda crackers are given for the first twenty-four hours after food is started. If they are still free from nausea at the end of that time, cereal, broth and

fruit juices are added. At the end of the next twenty-four hours if they are still free from nausea, they are put back on their regular diet. It is at this time that milk is first added to the diet.

No medication of any kind is given. This applies to cathartics, antipyretics and sedatives. It has been my experience that the more medicine one gives the longer the vomiting continues. There is an exception to this general rule of no medication in those severe cases where marked restlessness has occurred. In these cases, I have found chloral hydrate per rectum to be of value. Where the child is suffering from abdominal cramps I advise enemas, which almost invariably give relief. They may have to be repeated several times in the course of the day.

The treatment for those children in whom diarrhea is the outstanding symptom is essentially the same as in those with vomiting. They are given no food until they ask for it. The diet consists of gelatin, Jello, dry toast, cereal, soda or arrowroot crackers, broth and weak tea. After the first twenty-four hours if no vomiting has occurred, they are allowed milk which has been boiled for five minutes. No vegetables or fruits are given until the diarrhea has stopped. Where there is no nausea they are given regular water in large amounts in place of the Vichy water. No medication is given to control the diarrhea. Enemas are used if there is abdominal distension or cramps. Those children having either marked vomiting or diarrhea or both are carefully watched for any signs of dehydration or beginning acidosis and fluids are given by hypodermoclysis immediately when warranted.

As stated before, there are a fairly large percentage of children who, following the acute stages of this disease, fail to recover completely and continue to have more or less severe intestinal disturbances. I have found that the administration of Bulgarian or acidophilus bacilli in

some form seems to act almost as a specific in this condition. Inside of a very few days the intestinal symptoms and the feeling of malaise will disappear and the child return to normal health. The simplest and most effective means of giving Bulgarian bacilli is in the form of Bulgarian buttermilk, when it can be obtained and the child can be made to take it. The youngster is given at least one pint a day and as much more as he wants. However, many children do not like it, and when their appetite is poor and they do not feel well anyway, it is sometimes almost impossible to get them to take it. In these cases I have the mother give the acidophilus bacilli in the form of chocolate covered acidophilus blocks or in the liquid cultures of acidophilus bacilli that some of the pharmaceutical houses dispense. There is no difficulty in giving the acidophilus bacilli in these ways and the results are usually very satisfactory.

In conclusion I wish to emphasize again the great frequency with which gastrointestinal symptoms occur in infancy and childhood with upper respiratory infections and the varied forms which these symptoms may present. I would call attention to the prevalence of a rather specific upper respiratory infection which has been present in this part of the country for the last few years, in which the intestinal manifestations completely overshadow those of the respiratory tract. Because of its prevalence there has been a tendency to diagnose all intestinal disturbances in children as this infection and grave errors in diagnosis have been made. One should never make a diagnosis of "intestinal influenza" or "grippe" until he is sure that he is not dealing with an acute appendix, an intussusception, typhoid fever, pyelitis or any of the other conditions which can simulate the clinical picture of epidemic upper respiratory infection with marked gastrointestinal disturbance. Failure to make a correct diagnosis may lead to disaster for the patient.



## MENINGO-ENCEPHALITIS—A COMPLICATION OF EPIDEMIC PAROTITIS

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PAROTITIS is usually a harmless disease, but it may present a wide variety of complications which render it, at times, extremely serious. Orchitis is the most frequent complication and usually runs a benign course. Other complications reported are epididymitis, neuritis, endocarditis, nephritis, arthritis, mastitis, ovaritis, vulvovaginitis, and meningo-encephalitis. The incidence of these complications varies with different epidemics. The epidemic recently observed in Duluth has brought to our attention three cases with meningo-encephalitic involvement, evidently an indication of an infective strain with neurotropic tendencies.

The occurrence of frank symptoms of central nervous system involvement is relatively infrequent. Gunderson<sup>1</sup> concludes, from a study of the epidemic occurrence of mumps in Norway during the last one hundred years, that there is reason to look upon this infection as the origin of lethargic encephalitis. He states that epidemics of mumps recur regularly every eight to ten years, and during these epidemics the occurrence of secondary encephalitis and secondary serous meningitis is observed, and occasionally primary mumps meningitis without parotitis occurs. In all, about two hundred cases have been reported, of which about sixty have been described in the English literature. The majority of the cases have been reported in France and the South American countries. Schoenthal<sup>2</sup> states that the occurrence of meningitis in mumps receives little mention in German pediatric literature. Ackner and Casparis have summarized the literature up to 1913 and 1919, respectively. Since then not more than sixty cases have been added. As most patients recover after three to ten days illness, it is very probable that the meningeal condition is lost sight of, particularly in the milder cases, and this very likely accounts for the fact that so few are on record and so little is known of this complication. The symptoms may occur before or after the parotid involvement, but they usually occur at the height of the disease. In two

of our cases the meningo-encephalitic involvement was the only manifestation of mumps. Howard<sup>5</sup> reports three, and Wallgren<sup>6</sup> reports two such cases.

The symptoms of meningo-encephalitic involvement may vary a great deal, but usually consist of a rise in temperature, headache, nausea and vomiting (at times projectile), stupor, prostration, and nervous hyperirritability. Del Sel,<sup>7</sup> Walker,<sup>8</sup> Wallgren,<sup>6</sup> Shoenthal<sup>2</sup> add bradycardia to the above common symptoms. Joltrain<sup>9</sup> calls bradycardia a characteristic. This was not manifested in our cases. Photophobia, unilateral or bilateral deafness, monoplegia, hemiplegia, aphasia, speech disturbances, and psychic disturbances may be other expressions. Objective findings may reveal a positive Kernig and neck rigidity. Wallgren reports an instance of facial paralysis and also right arm and leg paralysis with recovery. Larkin,<sup>10</sup> in a report of two cases, described one case of paralysis of the left arm and the right leg. In the cases reported the complication appears more frequently in males than in females.

The spinal fluid findings are quite characteristic and with the history are diagnostic. In general, the authors agree that there is a clear or slightly cloudy fluid with increased pressure and a cell count of 20 to 2,000 with a predominance of lymphocytes (80 per cent or over). No microorganisms are found on smear or culture, but a slightly positive Nonne is present. Larkin reports two cases with normal spinal fluid, while Haden<sup>11</sup> and Howard<sup>5</sup> each report two cases with gram-positive diplococci. Blood findings usually are normal, but there may be a leukocytosis up to 18,000 with a percentage increase of lymphocytes. The temperature rarely is elevated above 103.8°. The few necropsies which have been recorded have shown a very marked congestion of the brain with a serous meningitis.

M. H. Gordon<sup>12</sup> injected ten monkeys intracerebrally with a bacteria-free filtrate from an uncomplicated case of mumps. Four of the ten

monkeys developed symptoms of nervous disturbance and died in three to nine days. The postmortem examination was negative grossly except for fatty changes in the kidney tubules and congested areas in the liver. No pus was found in the central nervous system, but some congestion was present. Section of the cord showed a variable degree of infiltration in the pia arachnoid with lymphocytes, as well as hyperemia. A certain proportion of nerve cells, both in the cortex and in the anterior horn cells of the cord, showed pronounced degenerative changes.

The diagnosis is not difficult when epidemic parotitis accompanies or precedes the symptoms of central nervous system involvement, and when one finds the rather typical spinal fluid findings. It is, of course, more difficult when no parotitis is present, but in the presence of a mumps epi-

throat was somewhat injected and there was some rigidity of the neck muscles. Reflexes were normal throughout. The Kernig and Babinski reflexes were negative. The temperature on admittance was 101° F. but rose to 103° F. in the afternoon. Spinal puncture yielded 5 c.c. of a clear fluid.

Laboratory: Blood and urine were normal.

Course and Treatment: On January 29, his temperature was 103.4 F.; there was a slight Kernig reaction, some headache and marked irritability. Spinal puncture was performed at 10 a. m. and 6 p. m. On January 30, temperature reached 103 F., headache was intense, there was pain in the eyes and the neck was rigid. The Manteau and Von Pirquet tests were negative. Spinal puncture was done at 11 a. m. and 10 p. m. On January 31, the temperature was 102.2 F., neck stiffness was unchanged, Kernig's sign was definitely positive. Spinal puncture was done. On February 1, temperature was 100.6 F., neck rigidity less, Kernig less marked, and patient feeling much better. X-ray of the lungs showed calcified glands in the left

#### SPINAL FLUID FINDINGS

Date	Amount	Pressure	Appearance	Number of cells	Percentage of lymphocytes	Nonne	Smear and Culture
1/28	5 c.c.	Normal	Sl. Hazy	—	89	—	Negative
1/29 a. m.	15 c.c.	Normal	Hazy	680	86	trace	Negative
1/29 p. m.	15 c.c.	1+	Hazy	562	95	—	Negative
1/30 a. m.	25 c.c.	1+	Sl. Hazy	689	88	—	Negative
1/30 p. m.	15 c.c.	1+	Clear	540	87	trace	Negative
1/31	10 c.c.	Normal	Clear	544	—	—	Negative

demic and direct exposure in a non-immune person, with the spinal fluid findings and the short convalescence, particularly after spinal drainage, one is almost certain as to the diagnosis.

In the differential diagnosis one must consider tuberculosis, epidemic cerebrospinal meningitis, and epidemic encephalitis.

#### CASE REPORTS

*Case 1.*—G. C. C., a schoolboy, aged 11, was admitted to the hospital on the service of Dr. C. O. Kohlbry, January 28, 1929. There was no definite history of mumps, but an epidemic existed and a history of probable contact.

Present Complaint: (1) Frontal headache; (2) fever; (3) nausea and vomiting; (4) hyperirritability; (5) general malaise.

Present Illness: The mother stated that the patient was chilled on January 26. He was put to bed because of a severe headache and the complaint of light hurting the eyes. The child was also very irritable. On January 27 the headache persisted with some projectile vomiting and high fever.

Past History: The child had had whooping cough, measles, scarlet fever, chicken pox and tonsillectomy.

Physical Examination: The patient was a well developed, well nourished boy, restless and apparently extremely sick. The eyes reacted to light and accommodation, the eye grounds being entirely negative. The

hilum. On February 2, temperature normal, no neck rigidity, Kernig negative, and patient feeling much better. The patient was discharged the same day.

*Case 2.*—W. B., a male, aged 17, was admitted to the hospital April 19, 1929, on the service of Dr. F. J. Hirschboeck.

Present Complaint: (1) Delirium; (2) amnesia for past two weeks.

Present Illness: On April 4 the patient was taken ill with mumps. He went to work the next morning, but returned home in the afternoon because of headache, nausea and vomiting, feverishness, and lethargy. Patient was put to bed on April 5, and since then remembers nothing about his illness. He was sent to the hospital for observation and treatment.

Past History: Patient had had measles, whooping cough and chicken pox.

Physical Examination: The patient was a fairly well developed and nourished young male, lying comfortably in bed. The eyes reacted to light and accommodation. The eye grounds showed slight increase in redness of the disc and retina. The throat was slightly injected. The examination was otherwise negative. The temperature on admittance was 97.6 F.

Course and Treatment: On April 19, spinal puncture showed a cell count of 55, lymphocytes predominating; Nonne showed a trace; colloidal gold curve was negative; Wassermann negative. The patient improved rapidly after spinal puncture and was permitted to go home two days later, apparently in good condition.

*Case 3.*—M. S., a male, aged 36, was admitted to the

hospital on April 17 on the service of F. J. Hirschboeck.

Present Complaint: (1) Fever; (2) headache; (3) nausea and vomiting; (4) general malaise; (5) tenderness in right testis.

Present Illness: Symptoms began on April 10 with general malaise, chills, fever and sweats. Two days later he developed a generalized pain which became more severe in the abdomen and head. Vomiting has persisted for the past two or three days, and a mild diarrhea with increase of fever developed.

Past History: Tonsillectomy; had contact with mumps. One child in family has mumps. No other sickness was present in the community.

Physical Examination: The patient was a well developed, well nourished white male, lying fairly comfortable in bed. The eyes reacted to light and accommodation. There was no tenderness of the parotids. The throat was slightly injected and there was a slight rigidity of the neck muscles. There was some general tenderness in the epigastrium with a suggestion of a spasm on the right side. The right testis was definitely tender, but there was no marked enlargement. The reflexes were normal. The temperature on admittance was 101 F. The blood and urine were normal.

Course and Treatment: On April 18 the temperature was 102.2 F. The patient felt better and the abdomen was less tender. There was still a slight rigidity of the neck muscles. On April 19 the temperature was 102 F. A spinal puncture showed 20 cells, mostly lymphocytes; the Nonne was positive; the colloidal gold curve was 000011100. He felt much better after the puncture.

On April 20 the temperature was normal and there was no headache or neck rigidity. He was discharged April 21, feeling perfectly well.

#### SUMMARY

Case 1 showed no definite relationship to mumps aside from the presence of an epidemic and exposure to infection. The usual symptoms, physical findings, spinal fluid findings, and the rapid recovery with spinal puncture suggest the diagnosis. Case 2 gives a history of definite parotid involvement, following which the meningo-encephalitic manifestations were expressed by delirium and amnesia, which cleared up promptly with spinal puncture. Case 3 gives a history of mumps in the family and an orchitis with meningeal symptoms which cleared up promptly with spinal puncture.

From these cases and review of the literature, mumps meningitis seems to be an infrequent and unusual complication. It is usually manifested

in the epidemic type rather than in the sporadic type of parotitis. The spinal fluid is either clear or slightly cloudy, with an increase in cells from 20 to 2,000 with a predominance of lymphocytes. Age seems to play a large part in the degree of cellular reaction shown by the spinal fluid in case 1, and the adult cases 2 and 3.

The diagnosis is made on the following:

1. The meningeal symptoms in the presence of parotitis or orchitis or an epidemic of parotitis usually beginning insidiously with a headache, vomiting, hyperirritability, general malaise, and some fever.

2. The spinal fluid findings and the relief obtained by spinal puncture.

3. The well-being of the patient during the course, which is very short.

4. The rapid recovery, which is usually complete. The treatment is spinal drainage.

For the privilege of studying these cases and for helpful criticisms the author is obligated to Drs. F. J. Hirschboeck and C. O. Kohlbry.

#### BIBLIOGRAPHY

- Gunderson, E.: Has lethargic encephalitis any relation to epidemic parotitis? *Jour. Infec. Dis.*, 41:257 (Oct.), 1927.
- Schoenthal, L.: Meningitis in epidemic parotitis. *Monatschr. f. Kinderheit.*, 36:306, 1927.
- Acker, G. N.: Parotitis complicated with meningitis. *Am. Jour. Dis. Child.*, 399 (Dec.), 1913.
- Casparis, H. R.: Cerebral complications in mumps. *Am. Jour. Dis. Child.*, 18:187 (Sept.), 1919.
- Howard, T.: Meningo-encephalitis as the only manifestation of mumps. With report of three cases. *Am. Jour. Med. Sci.*, 58:685 (Nov.), 1919.
- Wallgren, A.: Mumps meningitis without mumps. *Acta Paedæet.*, 6:53, 1926.
- Del Sel, M.: Mumps meningitis. *Prensa. Med. Argentina*, 13:417 (Oct. 10), 1926.
- Walker, F. D.: Report of a case of mumps with cerebral complications. *U. S. Naval Med. Bulletin*, 23:42 (July), 1925.
- Joltrain, E.: Meningeal mumps. *Med. Par.*, 9:207 (Dec.), 1927.
- Larkin, W. P.: Mumps meningitis found at Camp Taylor Base Hosp. with autopsy findings. *Ill. Med. Jour.*, 38:133 (Aug.), 1920.
- Hade, R. L.: The cerebral complication of mumps. *Arch. Int. Med.*, 23:737, 1919.
- Gordon, W. N.: Experimental production of meningo-encephalitis of mumps. *Lancet*, 1:652 (March 26), 1927.

## THE RECTAL EXAMINATION AND THE CONCEALED SECOND STAGE OF LABOR

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THE purpose of this paper is to point out a potentially serious danger in the rectal examination, namely, the danger of overlooking a concealed second stage of labor.

The following question immediately suggests itself: If a serious danger is resident in the rectal examination, why counsel its use when a vaginal examination permits greater accuracy of diagnosis? This question can be satisfactorily answered only after a thorough consideration of the relative merits of the rectal and vaginal examinations.

As far as I know, it has never been proven that, with any approximation to care in technic, the rectal examination can introduce bacteria into the vagina. From this standpoint it may be considered as harmless as no examination. If pathogenic bacteria are already in the vagina at the beginning of labor, due to an infected cervix or due to their introduction by intercourse, digital examination, septic douche nozzles, douches, etc., within a few days prior to labor, the rectal examination cannot be expected to protect the patient from the likelihood of a postpartum infection. In such a contingency, it has been objected that by a rectal examination one will smear the pathogenic flora over the inside of the cervix. The mechanism of normal labor is open to the same objection because the advance and recession of the presenting part and the bridge of membranes must tend to spread the vaginal flora. It is likely that in any labor, as soon as the cervix dilates and the cervical plug of mucus is dislodged, the vagina and uterus become one cavity and act as a Petri plate as regards extension of bacteria, modified of course by the flow of discharges and the bactericidal character of the secretions. The work of J. Morris Slemmons<sup>1</sup> on placental bacteremia tends to substantiate this likelihood; also the statistics of increased likelihood of infection following the performance of cesarean section late in labor and after the rupture of the membranes even when no vaginal examinations have been made. No bacteriologic proof has been offered, to my knowledge, of the

spreading of bacteria by the rectal examination. However, statistics exist that suggest that no examinations in labor may be less productive of postpartum rise of temperature and infection than the rectal examination. Even if this were certain, the fact remains that, in the course of teaching and practice, a comparatively few cases can be allowed to go without a pelvic examination because of the demands of diagnosis, of following the progress of labor, and of handling the problem of alleviation of pain in labor.

Ralph A. Reis,<sup>2</sup> in an analysis of 271 cases examined by rectum only and 106 cases where no examinations were made, recorded the following findings:

### AFEBRILE CASES

#### All cases

No exam. ....	56%
Rectal .....	46%

#### Spontaneous cases

No exam. ....	64%
Rectal .....	54%

### PELVIC INFECTIONS

#### All cases

No exam. ....	4.7%
Rectal .....	6.3%

#### Spontaneous cases

No exam. ....	4.9%
Rectal .....	6.6%

To my mind the figures of Reis point more clearly to the importance of prenatal care than to a clear deduction of the advantages of no examination over the rectal examination.

Concerning the vaginal flora of pregnant women and the potential danger of the vaginal examination we have much evidence at hand.

In 1894, Krönig<sup>3</sup> concluded from a study of 100 pregnant women that "the vaginal secretion of pregnant women who have not been examined, no matter whether normal, pathological, or highly pathological, never contains organisms which grow aerobically upon the ordinary media at the body temperature except yeast and gonococci and therefore never contains septic bacte-



ria." "The vagina of every pregnant woman who has not been examined is therefore aseptic."

In the same year Krönig<sup>4</sup> demonstrated that the vaginal secretion possessed a marked bactericidal action upon pathogenic organisms when introduced into the vagina and stated that "we may consider the vagina of a pregnant woman as aseptic if we are sure that two or three days have elapsed since she was touched."

In 1898 J. Whitridge Williams<sup>5</sup> published a report on the bacteria of the vagina and their practical significance based upon the bacteriological examination of the vaginal secretion of ninety-two pregnant women. His conclusions were:

1. "We agree with Krönig that the vaginal secretion of pregnant women does not contain the usual pyogenic cocci, having found the staphylococcus epidermis albus only twice in 92 cases, but never the streptococcus pyogenes or the staphylococcus aureus or albus.

2. "The discrepancy in the results of the various investigators is due to the technic by which the secretion is obtained.

3. "As the vagina does not contain pyogenic cocci, auto-infection with them is impossible; and when they are found in the puerperal uterus they have been introduced from without.

4. "The gonococcus is occasionally found in the vaginal secretion and during the puerperium may extend from the cervix into the uterus and tubes.

5. "It is possible but not yet demonstrated, in very rare instances, that the vagina may contain bacteria which may give rise to sapremia and putrefactive endometritis by auto-infection.

6. "Death from puerperal infection is always due to infection from without and is usually due to neglect of aseptic precautions on the part of the physician or nurse.

7. "Puerperal infection is to be avoided by limiting vaginal examinations as much as possible and cultivating external palpation. When vaginal examinations are to be made, the external genitalia should be carefully cleansed and disinfected and the hands rendered as aseptic as for a laparotomy. Vaginal douches are not necessary and are probably harmful."

To paragraph 6 of Dr. Williams' deductions I would like to add, intercourse within a few days of labor, manual vaginal examinations by the

patient, and unsterile douche nozzles and douches. I have felt justified in attributing many cases of sepsis to each and every one of these causes, where no examinations or operative procedures of any kind had taken place during labor and the preparation of the patient and the delivery technic and postpartum care were apparently as nearly perfect as possible. Postpartum sepsis following spontaneous deliveries during which no examination, or rectal examinations only were used, I believe to be attributable to infractions of prenatal care instructions or to failure to give any prenatal care instructions.

In 1902 Hjalmar Bergholm<sup>6</sup> published a most searching bacteriologic study of the vaginal secretion in pregnancy. His conclusions coincide with those of Krönig and Williams as regards the sterile character of the vaginal secretions in pregnant women. He states that "neither the staphylococcus pyogenes albus or aureus nor streptococcus pyogenes nor bacillus coli, is to be found in the vaginal secretion of the pregnant woman. The flora of the vulvar secretions is materially different from that of the vaginal secretions."

All these investigations permit one to feel with a large degree of assurance that, barring the presence of gonorrheal infection, meticulous prenatal care should bring the pregnant woman to labor with a sterile vagina. The consideration from the beginning of labor is to keep it sterile. Many of us believe that the rectal examination will do this, barring lapses in aseptic technic in the preparation of patient for labor and in the conduct of labor and the puerperium.

In this regard, what do we know about the safety and the potential danger of the vaginal examination conducted under strict aseptic technic?

We know of course that the better the technic the less chance there is of introducing infection into the vagina. Striking proof of the benefit of refinements in technic is brought out in the 1913 reports from the Sloane Hospital for Women, New York City. In these reports Dr. E. C. Lyon, Jr., showed that the routine use of the sterile rubber glove in vaginal manipulations markedly reduced the incidence of sepsis. In 16,000 cases before rubber gloves were routinely used, the incidence of sepsis was 1.13 per cent. In the last 12,000 cases in which the sterile rubber gloves

were routinely used the incidence was .61 per cent.

The most striking bacteriological demonstration of the potential danger of the vaginal examination can be found in a comparison of the researches of J. Whitridge Williams<sup>7, 8</sup> in 1893 and 1898. In his earlier work Williams found pyogenic cocci in the vagina in 53 per cent of his cases, including 20 per cent streptococci. In his later work, he found pyogenic organisms in only 2 per cent of the cases and not a single streptococcus. Williams' explanation of these differing results is, "the only explanation which suggests itself is that in the first series of cases bacteria, which were upon the labia minora and the margins of the hymen, were carried into the vagina by the introduction of the speculum and were then demonstrated in the cultures, while in the present series that possibility was avoided." The speculum referred to was a sterilized cylindrical glass speculum about two centimeters in diameter. In other words, it was about the size of the examining finger.

The potential danger of the vaginal examination suggested itself to Slemmons<sup>9</sup> in his work on placental bacteremia.

The potential danger of the vaginal examination is apparent in the comparative statistics of cesarean section without and with previous vaginal examinations.

As regards the actual statistical data concerning the relative safety of the aseptic vaginal and the rectal examination, one cannot find many large series in literature.

Pfleiderer<sup>8</sup> cites Jegge (Basel) as having compared 500 cases examined vaginally with 500 cases examined rectally. Those examined vaginally developed temperature in 11 per cent of cases as against 6 per cent with the rectal examination.

Guggisberg<sup>9</sup> presents compelling figures from the Poliklinik at Bern.

1902-1911	
Cases examined vaginally.....	4,642
Temperature reached 37.5.....	17.5%
Genital infection .....	11.2%
Deaths from sepsis.....	.12%
1912-1921	
Cases examined rectally.....	3,010
Temperature reached 37.5.....	11%
Genital infection .....	5.5%
Deaths from sepsis.....	0

I have been unable to find in literature any comparative statistics equal to these statistics in point of number of cases compared in which the vaginal examination appeared to be more safe than the rectal examination.

Reis<sup>2</sup> compared results in 609 cases examined by vagina, 271 cases examined by rectum, 106 cases delivering without examinations.

#### PELVIC INFECTIONS

##### All cases

Rectally examined .....	6.3%
Vaginally examined .....	5.9%
No examinations .....	4.7%

##### Spontaneous cases

Rectally examined .....	6.6%
Vaginally examined .....	5.3%
No examinations .....	4.9%

Reis also tabulated his cases according to whether they were febrile or afebrile. Any patients showing more than one-half of a degree centigrade rise of temperature at any time during the first seven days postpartum were considered, for the purposes of this investigation, as being febrile.

#### AFEBRILE CASES

##### All cases

Vaginal only .....	47%
Rectal only .....	45%
No examination .....	56%

##### Spontaneous cases

Vaginal only .....	57%
Rectal only .....	54%
No examination .....	64%

Reis made this investigation in 1914 in an attempt to determine what difference, if any, in morbidity rate and infection rate occurred following the two types of examination in a well-conducted maternity. He concludes:

"It would seem, from a study of the figures presented above, that the percentage of absolutely afebrile cases is definitely increased when neither rectal nor vaginal examinations are made and conversely that the percentage of pelvic infections is definitely decreased. There appears, however, to be practically no difference between the group examined vaginally and the group examined rectally. This holds true for the percentage of afebrile cases as well as for the percentage of pelvic infections. If then, as most workers agree, the rectal examination is only 90 per cent efficient for diagnosis, and if it is especially inadequate in abnormal and pathological cases,

it would seem that at least one vaginal examination is desirable early in every case of labor, particularly since there is no increased danger of infection from such an examination if carefully and properly done. That the number of vaginal examinations should be limited as much as possible is self-evident from a study of the figures presented.

"The rectal examination is, however, of value in observing the progress of labor and should supplement the initial vaginal examination. The rapidity and ease with which the rectal examination can be made recommend it strongly, but it does not seem that the rectal examination should replace the vaginal examination, especially in a well-conducted maternity where vaginal examinations can be made under aseptic conditions."

In the early part of his article Reis says: "In this series, the majority of cases was examined vaginally because the routine care of service cases in the Michael Reese Maternity required one careful vaginal examination immediately upon admission and preparation of the patient. The only exceptions to this routine are cases of appreciable vaginal bleeding or patients whose histories, measurements, or abdominal examination might indicate the possibility of a cesarean section."

After viewing from all angles the results of bacteriologic research, and all comparative statistics extant at the time concerning the relative safety of the vaginal and rectal examinations, I was led, in 1913, to change from the use of the routine vaginal to the routine rectal examination. Since that time, each year's experience, in all types of situations and conditions, has added to my conviction that the rectal examination is potentially the safer examination and that the vaginal examination, under the most meticulous aseptic technic, should be used only when the rectal findings leave one in doubt. It is my belief that the universal teaching and use of the rectal examination, considering all types of conditions surrounding the obstetric patient, would reduce the incidence of postpartum sepsis.

The following advantages are resident in the rectal examination:

1. With any approximation to care, the rectal examination cannot introduce bacteria into the vagina.

2. The sterilizable rubber glove, combined

with ordinary cleanliness and gentleness, makes it possible for even the most inexperienced student to conduct the examination without danger to the patient.

3. Without any increase in danger to the patient, the rectal examination permits of repeated examinations in all types of surroundings irrespective of any limitations offered by the examiner's training and perfection in aseptic technic.

4. It permits of repeated examinations with a great saving of time to the attendants and the examiner and with a great saving of inconvenience to the patient because of the fact that the rectal examination does not require the elaborate preparation for its performance necessitated by the aseptic vaginal examination.

5. Its teaching and use seems to emphasize the potential danger of the vaginal examination and stimulates all attendants to use as careful methods of preparation for performance of the vaginal examination as should be called for in the preparation for any obstetrical operation.

6. In over 95 per cent of cases that will terminate spontaneously, the rectal examination, in conjunction with the abdominal examination, will meet all the requirements of teaching and practice by giving all the data necessary for diagnosis, for following the progress of labor and for scientifically handling the problem of the alleviation of pain in labor.

7. In any case in which only rectal examinations have been used, if the necessity for interference arises we can institute said interference with the assurance that the rectal examinations have not introduced pathogenic bacteria into the vagina. Especially is this of great importance in cases complicated by antepartum hemorrhage and in those cases in which from the history, physical, and measurements we suspect that a cesarean section may be indicated with or without a test of labor.

The present-day knowledge, among educated people, of the danger of infection in labor makes the use of the rectal examination a source of reassurance to the patient and her family. When only rectal examinations have been used, if a postpartum rise of temperature takes place, the physician and the patient's family can have an increased feeling of security engendered by the fact that no infection could have been introduced

into the vagina by the rectal examination. To me this feeling of greater security following a delivery without vaginal manipulations is of great value because it acts as a source of confidence in the ultimate outcome of the case and decreases the strain of practice.

There are certain basic elements in the technic of the rectal examination that are of great importance in rendering it without danger.

First and foremost, the gloves used should be boiled so that no infection can be taken from case to case. The hands should be washed and dried, the gloves drawn on the examining hand and plenty of sterile lubricating jelly or vaseline applied to the examining finger. One must be careful not to frustrate the nursing technic of keeping the external genitalia clean. The examiner must be careful to keep away from the vulva. It is easy for the thumb of the examining hand to come in contact with the vulva or even enter the vagina if one is not aiming to avoid such a slip.

Although it is conceivable that one could be so careless and rough as to injure the anus and rectum, I have never seen such an injury. Even to the uninstructed, gentleness suggests itself, or is suggested by the patient.

It is unquestionably true that it is more difficult for the student to master the rectal examination than for him to master the vaginal examination in respect to accuracy of findings. But this difficulty is largely offset by the increased number of examinations he is allowed to make and therefore by his increased experience. My experience has taught me that the best way to initiate teaching in the rectal examination is to initiate it in the gynecologic and obstetric outpatient department, where on all gynecologic cases and on all pregnant cases in the early months the rectovaginal examination may be made and the student can check up his rectal findings by his findings with the vaginal finger. In this way he soon learns to delineate the cervix and appreciate its varying consistency and he soon learns the feel of an external os that will admit the finger. He also learns to appreciate any slight difficulties offered by the rectovaginal septum and the rectal valves. By the same token, rectal examinations alone, of patients in the last six weeks of pregnancy, especially in multiparæ, are most instructive because in many of these cases the presenting part is easily felt

and obliteration of the cervical canal and even dilatation has in many instances gone far enough to be distinctly manifest. If a student has had this practice he will soon master the rectal examination in labor. The potential accuracy of the rectal examination was impressed upon me lately when, in going over four hundred consecutive labors, I found that no vaginal examination had had to be used in spontaneous deliveries and in operative deliveries the preliminary vaginal check had substantiated the rectal findings.

All errors associated with a diagnosis by rectum of complete dilatation of the cervix have been in my experience without serious consequence. We have all likely experienced the inconvenience of being called by an intern and found the patient prepared and draped for immediate delivery and, when nothing happened, discovered upon rectal examination that he had not reached far enough to find the os and had mistaken a well obliterated cervical canal with a slight dilatation of the external os for complete dilatation. This mistake, though inconvenient, could cause no harm. We have all no doubt experienced the mistake of diagnosing complete dilatation in the presence of a tissue paper cervix with a pinpoint os. I have seen this mistake made with a vaginal examination and the mistake recognized only after visual examination with a speculum. Again, this is a mistake of little consequence because with no advance, after an arbitrary two or three-hour period, the vaginal examination will have checked up our error.

The only serious error that I have seen resident in the rectal examination is associated with the diagnosis of an undilated cervix. It is a serious error in the interpretation of rectal findings that may lead to disaster from incorrect management. This error consists in overlooking what I have come to designate as a concealed second stage of labor. Call this condition what you will, the rectal findings should lead one to suspect it and corroboration should be sought in the vaginal examination.

The rectal findings consist in a peculiarly soft cervix that hangs down from the presenting part like the open end of a bag; the cervical canal is obliterated but the external os does not appear to be completely dilated; and one is surprised at the ease with which one can pull the cervix from side to side in the attempt to palpate the directing features of the presenting part. During a



pain the cervix may disappear, only to appear again between pains. This is the cervix that may be found upon vaginal examination to be potentially completely dilated and offering no obstruction to the descent of the presenting part.

These findings are present most frequently in conditions interfering with complete flexion of the head or favoring extension of the head. I have encountered it most frequently in occiput posterior positions especially of the frontocotyloid variety.

It is a relatively infrequent condition, however, occurring in my observation in about one per cent of cases. However, as this makes it approximately six times more common than measurements necessitating cesarean section, at least in the State of Minnesota and its environs, and as incorrect handling may make its non-recognition as disastrous as the non-recognition of indications for cesarean section, I consider it relatively important.

The plausible explanations for these findings that suggest themselves are: that the peculiar position of the head by pressure, reflexly interferes with the normal retraction of the cervix; that actual pinching between the head and the pelvis interfered with retraction; and that both of these conditions are associated with the phenomenon that the head extends after previous flexion and jumps away from the dilated os much as a man walking on his head makes the steps by flexing and then suddenly extending his head.

The likely and usual series of events following the non-recognition of this so-called concealed second stage of labor are: the obstetrician carries the woman along in the belief that she is in the first stage of labor and, after hours or days of labor, is puzzled by the fact that there is no advance of the presenting part and no change in the cervix. Finally when signs on the part of mother or child demand interference, the real nature of the condition becomes manifest when one has to decide upon the best maneuver for the successful consummation of delivery. Unfortunately, by this time, especially if the membranes have ruptured early, version, a possible first choice, may be contraindicated and high forceps is the remaining alternative if the head is high. The end-result of course will depend largely upon the dexterity of the obstetrician, but, at best, the chances are not promising because of the condition of the child and mother. Had

this condition been suspected and recognized early, it is likely that no contraindication would have existed to interfere with a deliberate choice of the best maneuver for delivery and the delivery would have been executed with the child in good condition and with the mother not exhausted and not in a debilitated condition, making her a more easy prey to any low-grade infection that might be present.

The following two cases are of interest because in each case the condition existed in two successive labors and the difference between correct and incorrect management is clear.

*Case 1.*—Mrs. E., twenty-five years of age, a primipara, had been well since childhood and had had a normal prenatal history. Physical examination showed no abnormalities.

Measurements: Interspinous 27.5, intercrystal 29.5, external conjugate 20, right external oblique 22.5, left normal oblique 22.5, transverse outlet 8.5, promontory not reached.

O. L. A. position. Patient at full term.

Labor began at 11 p. m. February 22, 1923.

Desultory pains were present for two days, never less than four minutes apart. The patient was sustained with necessary sleep and rest provided by narcotics and soporifics. Light nourishment.

At 8 p. m. Feb. 25th, although the cervix by rectum was distinctly felt to be undilated the patient was taken to the delivery room. No change had taken place in the cervix for hours and there was no progress in descent. By vagina the cervix was found to be potentially completely dilated. The membranes were ruptured artificially and the case allowed to proceed.

No advance occurred in two and three quarters hours. The mother became exhausted and high forceps applied. Position O. L. A. The baby was delivered dead in thirty-five minutes. Bleeding from the nose and left ear indicated a likely fracture of the base of the skull.

Total labor 72 hours, 45 minutes.

Mistakes: A concealed second stage of labor went unrecognized through rectal examination and thus the length of labor was unnecessarily increased. Forceps were chosen rather than version with the head high and little or no moulding.

Final postpartum examination showed the cervix in excellent condition; a practical check that the child was not drawn through an undilated cervix.

Same patient. July, 1924.

Labor began at full term at 5:30 p. m., July 2.

At 9 a. m. July 3, the cervix was soft and not completely dilated as determined by rectal examination. A concealed second stage of labor was considered. At 11 a. m., no change in the rectal findings as to cervix and descent of head, the patient was taken to the delivery room for a vaginal examination. Vaginal examination showed the cervix potentially completely dilated and the head high. The membranes were rup-

tured artificially, immediate version performed and breech extraction. This maneuver was performed with ease and a 9 pound 9½ ounce live baby delivered.

Total labor 18 hours.

This labor, I believe, was handled correctly. It would not have been had I not suspected, by the feel of the cervix by rectum, a concealed second stage of labor, and immediately checked up my findings by a vaginal examination. I explained the lack of descent of the head to be due possibly to attitude. Version broke up this faulty attitude.

*Case 2.*—Mrs. A., twenty-six years of age, primipara. O. L. A. position. At term.

History, physical and antepartum care history normal, except for anemia in the latter part of pregnancy that did not respond to treatment. Her hemoglobin at term was 62 per cent.

Measurements: Interspinal 26, intercrystal 28, external conjugate 20, left external oblique 22, right external oblique 22.5. Transverse outlet 8.5; promontory not reached. Normal.

Labor began at 2 p. m. July 22, 1925.

On July 23, at 2:30 a. m., the cervix was soft, the cervical canal obliterated, and three fingers' dilatation. Examination showed the identical findings at 10 a. m. and again at 11 a. m.

At 5:18 p. m., the mother was exhausted and there was no change in the cervix or descent of head. A vaginal examination was made and the cervix was found to be potentially fully dilated, the membranes intact, and an O. L. A. position.

The membranes were ruptured artificially and because of the high position of the head a version and breech extraction was done. A normal 8 pound 6½ ounce child was delivered.

Total labor 27 hours 30 minutes.

I should have become suspicious of the concealed second stage earlier and checked up with the vaginal examination. She ran a mild postpartum sepsis and left the hospital on the thirty-first day postpartum. This twelve hours of what I believed, after delivery, to have been an unnecessary extension of labor may have been a factor in her postpartum sepsis through lowering of her resistance, especially in the presence of an anemia.

Same patient, June, 1928. At term. O. D. A. position. Again anemia in the latter part of pregnancy that did not respond to treatment. Hemoglobin 60 per cent.

Labor began at 5 p. m. At 6:15 p. m., rectal examination disclosed a complete obliteration of the cervical canal and two fingers' dilatation.

At 10:30 p. m. the cervix was very soft, there was a three fingers' dilatation, and a concealed second stage was suspected.

At 1:10 a. m. there had been no advance of the head and no change in the cervix. Vaginal examination revealed the fact that the cervix was potentially completely dilated. Membranes were ruptured artificially. O. D. A. position.

Version was chosen because of the high position of

the head. Easy version was performed and breech extraction of a living child weighing 8 pounds 6½ ounces. Total labor 8 hours 30 minutes.

Normal puerperium followed except for an anemia.

In this case I feel certain that the early recognition of a possible concealed second stage of labor and a vaginal check saved this woman many hours of unnecessary labor with the concomitant danger of reduced resistance therefrom.

To one experienced in rectal palpation, the danger of error in diagnosing a concealed second stage of labor by rectum when it does not exist, is only the danger of an occasional vaginal examination under the most rigid conditions of asepsis. The dangers likely to attend the non-recognition of the condition by rectum have been stated.

In the last analysis, conditions of operative dexterity being equal, the ultimate results will depend upon one's ability to recognize a potentially fully dilated cervix by vaginal examination, because, if one attempts an extraction by forceps or a version and breech extraction through a cervix not completely dilated, he courts one of the commonest present-day causes of fetal morbidity and mortality and maternal morbidity.

#### SUMMARY

1. A summation of the results of bacteriologic research and labor statistics bearing upon postpartum sepsis points to the conclusion that, whenever a pelvic examination is necessary in labor for purposes of diagnosis, of following the course of labor and of scientifically handling the problem of the alleviation of pain in labor, it is expedient to use the rectal examination first and the aseptic vaginal examination only in those cases in which the rectal findings leave one in doubt.

2. The greatest potential danger resident in the rectal examination is overlooking what has been called a concealed second stage of labor. In this condition the cervix, though potentially completely dilated, is easily palpated by rectum and may give the impression, to one not keeping the entity in mind, of a cervix not nearly completely dilated, and one may allow the patient to continue on in labor without making a vaginal check, believing that she is in the first stage of labor when she is really in the second stage. Unless one keeps this possibility in mind, one may not find

out his mistake until untoward signs on the part of mother and child demand interference and when, depending upon the time of rupture of the membranes, a choice of the maneuver best suited for a successful delivery may not be made, as, for instance, version with a high head, and when the conditions of mother and child are not so conducive to ultimate success as they would have been had the concealed second stage of labor been suspected and found on aseptic vaginal examination hours before.

3. The rectal findings that should lead one to suspect a concealed second stage of labor are: a peculiarly soft cervix that hangs down from the presenting part like the open end of a bag; a cervical canal obliterated but the external os not appearing to be completely dilated. One is surprised at the ease with which the cervix can be pulled from side to side in the attempt to palpate the directing features of the presenting part. During a pain the cervix may disappear only to appear again between pains. Where these findings exist, make an aseptic vaginal examination and proceed according to the indications.

## BIBLIOGRAPHY

1. Slemons, J. Morris: Placental bacteremia. *Jour. Am. Med. Assn.* (October 9), 1915.
2. Reis, Ralph A.: A survey of literature and an analysis of 1,000 cases in an endeavor to fix the status of the rectal examination in labor. *Am. Jour. Obst. and Gyn.*, 8:475 (Oct.), 1924.
3. Krönig: Scheidensekret-untersuchungen bei 100 Schwangere aseptik in der Geburtshilfe. *Contribl. f. Gyn.*, 3:10, 1894.
4. Krönig: Ueber das bakterienfeindliche Verhalten des Scheidensekrets Schwangerer. *Deutsche med. Wchnschr.*, No. 43, 1894.
5. Williams, J. Whitridge: The bacteria of the vagina and their practical significance, based upon the bacteriological examination of the vaginal secretion of ninety-two pregnant women. *Amer. Jour. Obst. and Dis. Women and Children*, 38:447 (Oct.), 1898.
6. Bergholm, Hjalmar: Ueber Mikroorganismen des vaginal Secretis Schwangerer. *Arch. f. Gyn.*, 495, 1902.
7. Williams, J. Whitridge: Puerperal infection considered from a bacteriological point of view. *Am. Jour. Med. Sci.* (July), 1893.
8. Pfeiderer: Scheiden oder Mastdarmuntersuchung? *Munch. Med. Wchnschr.*, 67:1116 (Sept. 24), 1920.
9. Guggisberg: *Arch. f. Gyn.*, 117:44, 1922.

# CASE REPORT

## COMMUNUTED FRACTURE OF THE PISIFORM BONE

A CASE REPORT

JOHN FRANCIS BRIGGS, M.D.  
and  
ARTHUR H. PEDERSEN, M.D.  
*St. Paul*

Fractures of the carpal bones are of rather common occurrence, but the tendency to underestimate the significance of injuries to the wrist often leads to errors in their diagnosis.

Fractures of the scaphoid and semilunar bones, the most frequent injuries of the carpals, are usually recognized and treated successfully. Lack of recognition of these fractures or improper treatment leads in the case of the semilunar to Kienböck's disease, and in the navicular bone to the progressive loss of function and crippling of an apparently normal wrist. Failure to employ the roentgenogram in these cases results in the patient's being treated for arthritis, neuritis, etc., until finally after many months the condition is recognized and heroic measures are instituted to alleviate the suffering.

Fractures of the other carpal bones are of rare occurrence; and because of their infrequency they are overlooked. The pisiform bone lying in its anterior position to the rest of the carpals is forgotten as a potential source of injury from direct trauma, hyperflexion and indirect violence. This bone differs from the rest of the carpals in its small size and method of origin. It maintains on its dorsal surface a single facet for articulation with the triquetral bone. The volar surface is rough and rounded, furnishing attachment to the transverse carpal ligament, the flexor carpi ulnaris and the abductor digiti quinti. In addition, two other small ligaments arise from this bone, the pisometacarpal and the pisohamate ligaments. The lateral surface of the bone is grooved for the ulnar artery.

The mode of development of the pisiform bone is somewhat questionable, some workers believing that it represents a sesamoid bone arising in the flexor carpi ulnaris tendon, while others feel that it is representative of a rudimentary digit.

Fractures of the pisiform are of unusual occurrence, but may be the source of a disabled wrist. R. B. Deane reports a case in a twenty-three year old male who believed he had sprained his wrist. Engel also reports a case of fracture of the pisiform bone in a sixteen year old youth who had sustained an injury to his wrist; he also cites a case of Pfab's in which ossification of the fractured pisiform bone failed to take place and the bone had to be removed. Jean and Solcard report a case of fracture of the pisiform bone in

a sailor and call attention to the case reports of Buybout in 1847 and of Alsberg in 1908. Jean in 1924 treated a second case of pisiform fracture in a workman who had been injured in a sixty-foot fall.

Undoubtedly there are more cases of pisiform fracture in existence which have not been reported, but we feel that the rarity of the condition warrants the recording of the following case.

The patient, J. D., forty years of age, was sent to us on July 8, 1929, because of pain in the right wrist and difficulty in moving his right small finger. He stated that while working at Aitkin, Minnesota, as a bricklayer, he completed his job on July 3 and was in a hurry to remove the debris and framework on the building for the Fourth of July celebration. While stripping supports from the building the scaffold on which he stood broke and the patient fell a distance of ten feet to the ground. He landed on his right side, using his right arm to break the fall. From his description his right hand was in the state of hyperflexion when he struck the ground. He went to the local physician's office for first aid treatment and then returned to St. Paul. On his arrival he noticed that the pain in his right wrist had become much worse, and that movement of his right small finger now caused him severe pain. His past history is essentially negative except for minor injuries incidental to his trade.

Physical examination, except for the injuries sustained in this accident, was negative and irrelevant to the present condition and may be omitted. Examination of the right wrist showed it to be edematous over the ulnar region. The hypothenar eminence was also swollen. There was complete inability to ulnar flex with a ten degree loss of hand flexion at the wrist joint; extension of the hand at the wrist was normal, but caused the patient severe pain. Voluntary attempts to flex or extend the right small finger also caused the patient pain. On palpation of the wrist, finger point tenderness was found over the pisiform bone. It was present to such an extent that the patient requested that the procedure be not repeated. A tentative diagnosis of fracture of the right pisiform was made and the patient was referred for x-ray study.

The first plate taken showed no evidence of bone injury, but the clinical evidence was such that the patient was returned to the x-ray department for a second plate, with the wrist in the oblique position. The second picture revealed a comminuted fracture of the right pisiform bone.

The hand and forearm were placed in ulnar flexion and dorsal extension by means of an anterior molded splint, and were left in this position for six weeks without passive or active manipulation. Plates were used for comparison during the six weeks of treatment and with the formation of callus the splint was removed. Two days later the patient had a complete



return of function of the right wrist without any pain and was able to return to work.

Healing in the carpal fractures is hindered by the use of active or passive motion. Such treatment may result in pseudo-arthroses or cavity formation in the bone from destruction of the osteoblasts and new blood vessels that have formed in the process of bone repair.

## CONCLUSIONS

1. Fractures of the pisiform bone are an unusual type of carpal injury.
2. Pisiform bone fractures may result in disability and should be considered in wrist injuries when dealing with a disability of vague etiology.
3. Treatment by dorsal and ulnar flexion with the use of an anterior molded splint usually gives a good end-result.
4. Improper treatment may result in necrosis and

absorption of the bone fragments, thus bringing about permanent disability.

706 Lowry Medical Arts Bldg.,  
Saint Paul, Minnesota.

## REFERENCES

- Deane, R. B.: Simple Fracture of the Pisiform Bone. *Ann. Surg.*, 54:229, Aug., 1911.
- Engel, A.: Case of Isolated Fracture of the Pisiform Bone. *Deutsche Medizinische Wochenschrift*, 53: 323, Feb. 19, 1926.
- Jean & Solcard: Fractures du Pisiforme. *Rev. d'Orthop.*, Par. 10:477-488, Nov., 1923.
- Jean, G.: Fractures du Pisiforme. *Bull. et Mem. Soc. Nat. de Chir. Par.*, 50:672-675, June 4, 1924.
- Bohler: Treatment of Fractures.
- Jackson, C.: Morris' Human Anatomy.

## PRESIDENT'S LETTER

SOMETHING like a generation ago there came the anti-tuberculosis movement. It proposed to prevent the spread of tuberculosis and to discover and cure incipient cases of pulmonary tuberculosis. The county tuberculosis sanatorium and clinic quickly followed.

At that period the rank and file of the profession, though reasonably proficient in diagnostic and therapeutic skill, foolishly believing the sanatorium staff and its clinic possessed greater ability than themselves, promptly passed their patients along, lost interest in tuberculosis and directly forgot the knowledge and skill once theirs. A little later and the sanatoria and their clinics were swamped with cases in all stages of the disease, both medical and surgical. The defect in the system now became apparent in the lack of doctors in the general field sufficiently skilled to aid in taking care of these cases. Since then this defect has been largely corrected.

Now comes the heart movement. It takes form in the activities of several different organizations more or less closely allied. First comes The American Heart Association seeking to discover the incidence, causes, and prevention of heart disorder. Then comes the Public Health Association seeking to ferret out cases of heart disease, establish clinics for the treatment of same, and to find employment for the partially incapacitated. Other clinics representing lesser organizations are also in process of formation. The two major organizations, in some places at least, seek to link the heart movement with the anti-tuberculosis movement and carry on as a unit activity.

The work of these organizations so far as the study of incidence, etiology, distribution, prevention, economic aspects and emplacement are concerned is most commendable. But when their clinics appear with mass treatment of patients as a part of their work, especially when linked with the field of tuberculosis, they take a step that is ill advised, because it tends to be destructive to the scientific morale of the rank and file of the medical profession, and because a contagious and a non-contagious type of disease are linked together. Carried to its logical conclusions the effect on the profession will be the same as in the anti-tuberculosis movement, and that must not occur again.

This is the point at which the Minnesota State Medical Society steps in. Through its Heart Committee in conjunction with the committee on Hospitals and Medical Education it proposes to take an active and effective part. It proposes to see to it that its members shall have every opportunity to keep abreast of the best and most progressive heart thought and practice of the day. It is determined that its members shall not lag and lose interest in this vital subject, shall not say, "Let George do it."

The understanding of heart disorders is not difficult. The modern classifications based on etiology, structural change and function are most simple and illuminating. They are most stimulating to your interest. They pique your medical curiosity. It is along these lines the two above mentioned committees will proceed. The Heart Committee will formulate details of heart instruction while the Committee on Hospitals and Medical Education will disseminate this knowledge through its extension service.

Lend these committees your most hearty support to the end that the clinic may not be needed and to the glorification of yourselves and your profession.



President,  
Minnesota State Medical Association.

# EDITORIAL

## MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

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The Minnesota State Medical Association  
Under the Direction of Its

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Subscription Price: \$3.00 per annum in advance. Single Copies 25c. Foreign Countries \$3.50 per annum.

Vol. XIII February, 1930 No. 2

## KARKINOLYSIN AND CANCER

In this number of MINNESOTA MEDICINE there is published an article by Dr. Adolph M. Hanson of Faribault, Minnesota, on the treatment of inoperable cancer with thymic extract. No one who is acquainted with Dr. Hanson can doubt his honesty and sincerity; and his previous work on the parathyroid attests his ability as an investigator. Four cases of cancer treated with thymic extract are reported. Case 1 is clearly an adenocarcinoma of the splenic flexure. This patient lived about four years after surgical removal of the tumor. Death was attributed to pneumonia, but there was no postmortem exam-

ination. If a cure was really effected in this case, it might be attributed to surgery.

In Case 2 the clinical diagnosis was carcinoma of the stomach, but no diagnosis can be made on the microphotograph. About one year after the exploratory operation the tumor could no longer be palpated. The patient gained in weight and was in good health when last heard from. The date when the patient was last heard from is unfortunately not given, and she was apparently not examined later than June 12, 1926.

In Cases 3 and 4 the period of observation is entirely too short to determine the efficacy of the treatment.

The author does not state whether any other cases of cancer were treated, and this is a very important omission. Are these four cases the only ones treated, or are they the only ones reacting favorably?

Dr. Hanson makes it clear that he does not claim to have discovered a cure for cancer, but he would have us believe that thymic extract is of value as a palliative treatment. But even this claim is not justified by the case histories that are reported. The clinical history of cancer is very variable. Physicians of long experience know that persons with inoperable cancer often live several years in apparently good health.

It is possible that thymic extract causes necrosis of the central part of large malignant tumors, such as is sometimes observed after treatment with radiation, lead, or Coley's toxin.

Dr. Hanson should be encouraged to continue his work, but much stronger evidence of the value of the treatment must be produced before it can be recommended to the medical profession.

E. T. B.

## MORTALITY PREVENTION IN MOTHERS AND INFANTS

The Commonwealth Fund has recently made public the results of a four-year demonstration of the value of preventive medicine in the field of prenatal maternity and postnatal infant care. The following four locations were chosen for the experiment: Fargo, North Dakota; Marion

County, Oregon; Clark County, Georgia; and Rutherford County, Tennessee. The results are striking. The total figures show that the maternal death rate, stillbirths and infant mortality under one month of age were about double in the group that received no medical or nursing care. In some of the localities the death rate in the three groups was several times as great in those who received no supervision. During the first year of life, more than twice as many infants not receiving supervision died, as in the supervised group. The diseases which accounted for the difference were for the most part enteritis, acute respiratory infections and congenital defects.

One may argue that the group which sought medical and nursing care represented the more intelligent group in each community, the mere fact of their seeking or accepting instruction indicating their higher intelligence; and that this group without medical care would have shown a lower mortality. We do not know how important this factor was in this particular demonstration but it does not seem likely that this would have accounted for the marked difference demonstrated.

The importance of preventive medicine is appreciated by most of us. The public is having it more and more impressed upon its individual members. There is evidence from time to time of a lagging in interest on the part of certain members of the profession responsible for this type of work. Examination of well infants, for instance, may in time lose its attraction to the examining physician and he may lose some of his enthusiasm. The importance, however, of proper feeding of the normal infant has become further emphasized in recent years. Proper vitamin content in the diet in maintaining an infant's maximal resistance to infection and in not only preventing manifest rickets but assuring normal dentition makes the subject all the more intriguing.

For those who require figures to be convinced of the results attainable by medical supervision of mothers and infants we would recommend a perusal of the figures submitted in this demonstration.\*

\*Health Officers' News Letter. Vol. IV, No. 11. Amer. Pub. Health Assn., 370 Seventh Avenue, New York City.

## FAIR PLAY

There has lately been considerable criticism of our old friend Dr. Brady, particularly in regard to certain statements made by him in regard to the indications for tonsillectomy, and the best methods of removal of healthy and diseased tonsils. Of course, it is axiomatic that no human, with the possible exception of the above mentioned columnist, is capable of gathering together in one small cranium all the Truth regarding even such a circumscribed field as that of modern medicine, let alone being able to grind it out daily for the consumption of the lay neuro- and hypochondriac. The fact that his statements hold water somewhat over 50 per cent of the time should be a cause for congratulation, rather than censure.

And when one begins to realize the subtle manner in which the financial welfare of the profession is being aided and improved by these articles we should add our heartfelt gratitude to our congratulations.

For instance, there is a well-established belief that tonsillectomies in the adult are becoming scarcer and scarcer as the years pass by, due, of course, to the fact that almost all grown-ups of the present generation lost a greater or lesser amount of their tonsillar tissue during childhood, infancy, or early youth, and, if a clean-cut tonsillectomy was done at that time, the patient is automatically protected against any further interference, and, by the same token, the profession is deprived of its right to do a secondary tonsillectomy.

Contrast this situation with that which we may expect if the good doctor is successful in his propaganda for the "electric" method of tonsil removal. In the first place, the patient can be kept coming to the office for treatments, "burning," "desiccation," "coagulation," and so forth, for almost an unlimited number of visits, and, when he does quit from exhaustion, either physical or financial, there is still plenty of infected adenoid tissue left in the tonsillar fossæ, which, when solidly sealed in by the resulting scar tissue, will almost invariably result in a mass attack on the part of the whole "itis" family, and drive the patient into the arms of a competent surgeon. Naturally, a secondary tonsillectomy through this mass of scar tissue is exceedingly difficult and the operator is certainly



entitled to a greater fee than can be honestly demanded for removing virginal tonsils.

The writer has had this condition forcibly brought to mind in two cases of recent date, whose histories are almost identical. Enlarged tonsils, and occasional sore throat. Tonsillectomy had been advised. The possessors were saved from this ordeal by the timely perusal in the morning paper of an article by our good friend, the doctor, and immediately took advantage of the "new electrical" method. After an inordinate loss of time and considerable expense, healing was at last allowed to take place, and, once solidly healed, both patients came down with a subacute arthritis which persisted until the infected foci were removed. These patients are now well, and happy to have safely passed through such a serious ordeal, and can now recall and discuss their symptoms with other sufferers, to their hearts' content.

Space will not permit discussion of the dictum that 70 per cent of all removed tonsils should have been left alone. Certainly if that high a proportion of tonsils are unaffected, no very harmful results can accrue from the method of electro-coagulation. The patient is no worse off than before, and his doctor is that much ahead. At the same time it has functioned as a therapeutic test which works out as follows: If the patient is no better nor no worse than before, then he is one of the 70 per cent whose tonsils did not need to be removed. If he develops symptoms of absorption following the incarceration of the tonsillar bacteria, it is definite proof of tonsillar infection and an indication for tonsillectomy. Let us be fair—and slow to criticize, for who knows when he may "bite the hand that feeds him"?

M. W. W.

#### HISTORICAL COMMITTEE

Will not some of you who read this stuff help stimulate the gathering of material for our History of Medicine in Minnesota? Contribute something so I shall not have to think up new things from month to month to publish here. Our own knowledge of early medical men and events is largely confined to our own city and you may become tired of it. We thought the first

published medical communication came from Minnesota in 1853 and J. H. Murphy contributed a note on abscess of the breast in 1854. A few months ago, however, we found an article written in 1814 and published in 1816 by the first medical officer at Ft. Snelling, and a still shorter time ago we picked up unexpectedly Vol. I, No. 4 (January, 1859) of the "Minnesota Homœopath" published in St. Paul. We had always thought Dr. A. J. Stone's Northwestern Medical and Surgical Journal (1870) the first. After looking over the Homœopath, however, we concluded it hardly merits the name of a journal, but nevertheless it gave us an historical, not hysterical, thrill.

Write Dr. H. M. Workman, Tracy, Minnesota, if you know anything interesting. The Committee will appreciate it.

J. M. A.

#### THE COMMITTEE ON FOODS.

The need of some body to express judgment of food products and food advertising, in the same way that the Council on Pharmacy and Chemistry considers medical preparations, has become apparent. The Council has therefore created a special committee on foods. The manufacturers of food products, distributors and all others interested in the promotion of natural food substances or of modified foods, for which claims are made in relation to the promotion of good health, will be asked to submit to the committee the products and the advertising material used in advancing their sale. If a product is found acceptable by the committee, advertisements of it will be permitted in the publications of the American Medical Association, the product will be listed in the book on foods similar to New and Non-official Remedies, and the manufacturers will be permitted to use a symbol indicating that the product has been accepted by the committee for listing in the book of foods. If the product cannot reach the standards set forth, a report will be published as is done for drug products, and advertising of the preparation will not be permitted in the publication of the American Medical Association. The work of the Committee on Foods should do much to carry still further the message of good hygiene and of scientific medicine. In beginning this work, the Council on Pharmacy and Chemistry again asks the complete support of the medical profession. Only by the sincere coöperation of the medical profession with the committee can it achieve the prestige necessary to complete attainment of its objects. (Jour. A. M. A., October 12, 1929, p. 1147.)

## A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

### State Medicine

An extremely interesting prospectus for a new project in the field of public health to be undertaken this year by the Commonwealth Fund has been sent to every state health officer in the United States and the deans of the medical schools.

This Commonwealth Fund was established ten years ago by the Steven V. Harkness fortune of Rockefeller Oil affiliations.

Education and child welfare were its original objects. But a recently established division of public health with Dr. William J. French as director has had the following proposal outlined in its main points below, as sequel.

From one point of view this fund proposes to show state health departments how they make detection and cure of disease a state function. It proposes, also, to assist in paying the bill.

Is it, in other words, just another very important step toward the establishment of "State Medicine"?

The two related lines of public service planned by the fund fall under two heads, "public health activities" and "medical service." They are to be put into effect in two or possibly three states where health departments desire and request it.

#### I. PUBLIC HEALTH ACTIVITIES

A. The establishment, under direction of the state health department, of a field unit for the purpose of organizing and improving county or district health service in rural areas.

B. Assistance, through the state health department, to two rural counties or districts in the state for the purpose of establishing complete health units to render public health service according to the best current standards. The minimum unit which will be considered for such assistance will include a full-time health officer, a sanitary officer, two public health nurses, and one clerk. Larger units are to be preferred.

#### II. MEDICAL EDUCATION

A. Assistance to a Grade A medical school which sends a reasonable percentage of its graduates into the state in question: to develop courses in preventive medicine, and to provide special facilities and opportunities for postgraduate work by rural physicians. While this school will presumably be located in the state selected, a school elsewhere may be designated if it customarily draws students from the state in large numbers.

B. The establishment at the same medical school of a scholarship or loan fund for the use of not less than five students from the state in question who agree to go into rural practice in that state for a stipulated period after graduation.

C. The establishment of fifteen postgraduate fellowships each year for physicians in each state selected for the public health activities mentioned above, as a contribution toward raising the standards of rural medical practice. Five fellowships will be awarded in each of the counties or districts where health units are established, and five in the state at large. Appointments will be made by the Commonwealth Fund.

#### III. PUBLIC HEALTH NURSING

A. The establishment of one or more postgraduate fellowships for public health nurses actually employed in the state selected.

#### IV. HEALTH EDUCATION

A. Assistance to the state normal school, or other teacher-training institution, in providing facilities for the training of teachers in the purposes and methods of health education.

B. The establishment of one or more fellowships in health education to be awarded each year to teachers employed in the schools of the districts where health units are established under this plan.

This plan in its entirety is intended to be flexible and experimental. No fixed time-limit has been set for its operation. The staff of the Division of Public Health will endeavor to assist in correlating the educational projects in each state with the public health activities to the end that progress may be consistent and concrete.

## REPORTS AND ANNOUNCEMENTS OF SOCIETIES

### MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over State WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

*Speaker:* William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of February will be as follows:

February 5, 1930—Pork worm disease

February 12, 1930—Glaucoma

February 19, 1930—Feeding the problem child

February 26, 1930—Inflammation of the ear

### WHITE HOUSE CONFERENCE ON CHILD HEALTH AND PROTECTION

A conference of pretentious dimensions, the function of which will be to consider the various phases of child health, has been put under way by President Hoover. Financed by contributions from the great foundations and headed by Dr. Ray Lyman Wilbur, Secretary of the Interior, the conference is to be national in scope. Instead of consisting of a conference meeting of two or three days' duration, a number of meetings in addition to those already held in Washington, New York, Philadelphia and Boston will be held over a period of one to two years.

Committee appointments of those prominent in the profession, in public health work, nursing, institutional work, and so forth, have been made and every phase of the subject of child welfare will be included in the program. This comprises a consideration of factors influencing the child from the standpoint of heredity, prenatal care, birth, nutrition in infancy and childhood, child psychology, etc.

The following committee and sub-committee chairmen have been appointed:

#### SECTIONS

*Section I. MEDICAL SERVICE, Samuel McC. Hamill, M.D., Philadelphia, Pa.*

- A. Growth and Development, *Kenneth D. Blackfan, M.D., Boston, Mass.*
- B. Prenatal and Maternal Care, *Fred L. Adair, M.D., Chicago, Ill.*
- C. Medical Care for Children, *Philip Van Ingen, M.D., New York City*

*Section II. PUBLIC HEALTH SERVICE AND ADMINISTRATION, Hugh S. Cumming, Surgeon-General, Washington, D. C.*

- A. Public Health Organization, *E. L. Bishop, M.D., Nashville, Tenn.*

B. Communicable Disease Control, *George H. Bigelow, M.D., Boston, Mass.*

C. Milk Production and Control, *H. A. Whittaker, C.E., Minneapolis, Minn.*

*Section III. EDUCATION AND TRAINING, F. J. Kelly, Ph.D., University of Idaho*

A. The Family and Parent Education, *Louise Stanley, Ph.D., Washington, D. C.*

B. The Preschool Child, *John E. Anderson, Ph.D., Minneapolis, Minn.*

C. The School Child, *Thomas D. Wood, M.D., New York City*

D. Vocational Guidance and Child Labor, *Anne S. Davis, Chicago, Illinois*

E. Recreation and Physical Education, *Henry Breckenridge, New York City*

F. Special Classes, *Chas. S. Berry, Ph.D., Ann Arbor, Mich.*

*Section IV. THE HANDICAPPED: PREVENTION; MAINTENANCE; PROTECTION, C. C. Carstens, New York City*

A. State and Local Organizations for the Handicapped, *Mrs. Kate Burr Johnson, Raleigh, N. C.*

B. Physically and Mentally Handicapped, *William J. Ellis, Trenton, N. J.*

C-1 Socially Handicapped — Dependency, *Homer Folks, New York City*

C-2 Socially Handicapped—Delinquency, *Frederick P. Cabot, Boston, Mass.*

### RICE COUNTY MEDICAL SOCIETY

A meeting of the Rice County Medical Society was held in the Faribault Clinic Rooms December 11, 1929. In addition to twenty-five members of the society, Dr. C. B. Wright, Minneapolis; Dr. E. A. Meyerding, St. Paul; Dr. W. D. Beadie, Cannon Falls; Dr. Emerson, of Northfield; and Dr. D. E. McBroom, Cambridge, were present.

The meeting was called to order by the President, Dr. J. M. Murdoch, and after the minutes of the previous meeting were read and approved, and other routine business disposed of, Dr. Adolph M. Hanson of Faribault read a paper entitled "A Report of Four Cases of Inoperable Cancer Treated by Intramuscular Injections of Karkinolysin."

Dr. Hanson, after completing his pioneer work on the parathyroid gland and its calcium-raising hormone, has spent several years of research work and experimentation on the cause and treatment of cancer, and has finally reached that stage when it was deemed advisable to reveal his results thus far, for the first time, to the members of the society, in order that clinical experimental work may be carried out on a larger scale by other investigators.

Dr. Hanson does not wish to be understood as having a specific cure for malignancy, but Karkinolysin evidently has a solvent action in the cases reported of sufficient interest to report his findings to the profession.

Dr. Hanson received generous expressions of commendation for his achievement thus far in this direc-

tion, by Drs. C. B. Wright, Ex-president of the Minnesota State Medical Association; E. A. Meyerding, Secretary of the Minnesota State Medical Association; W. D. Beadie, Superintendent of Cannon Falls Sanitarium; D. E. McBroom, Superintendent State Epileptic Colony at Cambridge; and members of the Rice County Medical Society.

Dr. Murdoch, President, in behalf of Rice County Medical Society, thanked Dr. Hanson for his interesting message, and assured him the full support and best wishes of the society in his future work.

There being no further business the meeting stood adjourned.

C. J. PLONSKIE, M.D., *Secretary*.

### CONFERENCE OF SECRETARIES

Seventy-five physician-delegates representing 28 different district and county medical societies registered for the annual conference of secretaries of the Minnesota State Medical Association, held Jan. 11, 1930, at the Athletic Club in St. Paul. Dr. F. C. Schuldt, president of the Ramsey County Medical Society, welcomed the delegates.

High lights on the program of the conference included a lively discussion of the high cost of hospital care and its causes; the relation of the medical association to the current heart disease campaign; and the safe storage of inflammable x-ray film.

Dr. I. C. Riffin, New York, executive secretary of the American Heart Association, outlined the proposed program of the national association for the conference. Dr. N. O. Pearce, Minneapolis; Dr. F. A. Willis, Rochester; Dr. O. E. Locken, Crookston; Dr. S. A. Slater, Worthington; and Dr. J. F. Borg, St. Paul, discussed the local aspects of the campaign.

Dr. Pearce, Dr. William A. Meierding of New Ulm, and Paul Fesler, superintendent of the University Hospital, spoke on the community hospital, its organized staff and its costs.

Fire prevention officials of Minneapolis and a representative from the Eastman Kodak Company explained methods of protection for storage of the inflammable nitro-cellulose film and urged the secretaries to substitute the acetate safety variety of film for the inflammable nitro-cellulose in x-ray work. Dr. S. H. Boyer, Duluth; Dr. C. G. Sutherland, Rochester; and Dr. C. B. Wright, Minneapolis, related their experience with both types of film and with film storage.

Mrs. J. D. Lyon, president of the Women's Auxiliary, discussed the activities of her organization.

Interesting aspects of legal medicine and malpractice insurance encountered by F. M. Brist, St. Paul attorney for the State Board of Medical Examiners, with discussion by Dr. W. H. Hengstler, St. Paul, and Dr. H. M. Johnson, Dawson, and a review by Dr. F. H. Magney, Duluth, of the successful lay health education program carried on by St. Louis County Medical

Society, also had a place on the day's program. Dr. George Earl, St. Paul, indicated the inevitable place of the practicing physician in public health programs of the future.

### RED RIVER VALLEY MEDICAL SOCIETY

The following officers were elected by the Red River Valley Medical Society at their annual meeting December 19, 1929:

Dr. C. M. Adkins.....Gryla.....*President*  
Dr. Halvor Holte.....Crookston.....*Vice President*  
Dr. C. L. Oppegaard.....Crookston.....*Secretary-Treasurer*

Dr. Arthur Kahala, of Crookston, was elected censor for three years.

The following members were elected to represent the society at the state meeting for 1930: Dr. H. M. Blegen, Warren, first delegate; Dr. I. G. Wiltrout, Oslo, first alternate; Dr. O. E. Locken, Crookston, second alternate; Dr. J. F. Norman, Crookston, second alternate.

### HENNEPIN COUNTY TUBERCULOSIS ASSOCIATION

The Hennepin County Tuberculosis Association held its twenty-seventh annual meeting in the Citizens Aid Building, Minneapolis, Thursday evening, January 30.

The Board of Directors met preceding the dinner to elect new officers, and during the dinner election of new Association members and new Board members was made.

Speakers, each of whom contributed to the picture of "How Our Community Is Meeting Its Tuberculosis Problem," included:

Dr. H. A. Burns, superintendent, State Sanatorium; Dr. E. S. Mariette, superintendent, Glen Lake Sanatorium; Dr. Jay A. Myers, Chief of Staff, Lymanhurst Clinic and School; Dr. F. E. Harrington, Health Commissioner, Minneapolis; Dr. Walter J. Marcle, Veterans Bureau; Dr. N. O. Pearce, president, Hennepin County Tuberculosis Association; Dr. H. L. Ulrich, chairman, Heart Committee, Hennepin County Tuberculosis Association; Dr. E. A. Meyerding, executive secretary, Minnesota Public Health Association.

### TREPARSOL

Treparsol differs from the better known acetarsone in that it has a formyl group in place of the acetyl group of acetarsone. Its oral use, as with acetarsone, in the treatment of syphilis is not supported by adequate evidence. Treparsol has not been accepted by the Council on Pharmacy and Chemistry. (Jour. A. M. A., December 7, 1929, p. 1830.)



## COMMUNICATION

DEPARTMENT OF COMMERCE  
AERONAUTICS BRANCH  
WASHINGTON

December 21, 1929.

To the Editor:

The attached resolutions were passed by the American Medical Association at its stated assembly held at Portland, Oregon, in July, 1929. It is believed that these resolutions are of sufficient interest in view of the rapidly increasing number of physicians designated as Medical Examiners to warrant publication in your journal.

You may be interested to know that all applicants for federal pilot licenses, either for flying or for training as pilots, must pass physical examinations before physicians designated by the Secretary of Commerce. They must likewise be re-examined periodically. These examinations cover a rather detailed examination of the eyes, a brief examination of the ear, nose and throat, equilibrium, a general physical examination, and a detailed examination of the nervous system. There are now about 750 Medical Examiners so designated throughout the country. All these examinations are reviewed in Washington, where the applicant is finally certified as qualified or disqualified for the grade for which he has applied.

Very truly yours,  
L. H. BAUER, M.D.,  
Medical Director.

Whereas, The Aeronautics Branch, Department of Commerce, has organized a medical service for the physical examinations of civil pilots and prospective pilots, in the interests of safety; and

Whereas, The physical standards adopted are in keeping with those adopted universally, and have reduced aircraft accidents from physical causes to a minimum; and

Whereas, The department has required these examinations to be made only by designated physicians in the interest of uniformity and control and in accordance with the custom adopted for the Army and Navy and in other countries; and

Whereas, The selection of examining physicians by the department has been based on training as flight surgeons or its equivalent, or on group examinations by specialists, a high standard of examination has resulted; and

Whereas, The department requires that all examiners hold the degree of Doctor of Medicine, be licensed to practice medicine under the laws of their respective states, and further requires that the appointees be recognized as ethical practitioners in their respective localities, thereby supporting the high standards advocated by this Association, be it

RESOLVED, That the American Medical Association

at its stated assembly in 1929 endorses the medical work of the Department of Commerce, its methods of physical examination and its method of selection of medical examiners, and urges that the same high standards be continued and offers the support of the American Medical Association in furthering the specialty of aviation medicine; and be it further

RESOLVED, That a copy of this resolution be sent to the President of the United States, the Secretary of Commerce, and the Secretary of each state medical society.

## NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council of Pharmacy and Chemistry:

E. BILHUBER, INC.

Lenigallol-Zinc Ointment

CUTTER LABORATORY

Scarlet Fever Streptococcus Antitoxin-Cutter

MEAD JOHNSON & Co.

Mead's Viosterol in Oil 100 D

H. K. MULFORD Co.

Ampules Sodium Cacodylate-Mulford,  $\frac{3}{4}$  grain, 1 c.c.

Ampules Sodium Cacodylate-Mulford, 3 grains, 1 c.c.

Ampules Sodium Cacodylate-Mulford, 5 grains, 1 c.c.

WINTHROP CHEMICAL Co., INC.

Tablets Tutocain No. 6

The following article has been exempted and included with the List of Exempted Non-medicinal Articles (New and Non-official Remedies, 1929, p. 485):

CHILD WELFARE GUILD, INC.

Bite-X

## TRUTH ABOUT MEDICINES

*Gelatin Compound Phenolized-Mulford.*—A mixture composed of gelatin, zinc oxide, glycerin, and water, containing 1.5 per cent of phenol. It is used in the preparation of bandages to cover chronic ulcers, unhealed secondary burns, and in the preparation of pressure bandages for varicose veins, when surgical treatment is not necessary. H. K. Mulford Co., Philadelphia.

*Diphtheria Toxoid-Mulford, 30 c.c. Vial.*—Diphtheria Toxoid-Mulford (New and Non-official Remedies, 1929, p. 369) is also marketed in packages of one 30 c.c. vial. H. K. Mulford Co., Philadelphia.

*Typhoid-Paratyphoid Prophylactic, Hospital Packages.*—Typhoid-Paratyphoid Prophylactic (New and Non-official Remedies, 1929, p. 379) is also marketed in hospital size packages containing ten complete immunizations. Cutter Laboratory, Berkeley, Calif.

*Ampule Solution Silver Nitrate 1 Per Cent-Cutter.*—Solution silver nitrate 1 per cent, approximately 0.2 c.c., contained in ampules composed of beeswax. They are used for the prevention of ophthalmia neonatorum. Cutter Laboratory, Berkeley, Calif.

(Continued on Page 129)

## CONSULTATION BUREAU

WM. A. O'BRIEN, M.D., *Director*

Minnesota State Medical Association

11 West Summit Avenue

Saint Paul, Minnesota

1. *Question.*—I have a patient, a nine year old boy, who complained of intermittent aching pain in the right shoulder. There was no history of injury. Physical examination was negative except for slight tenderness in the upper end of the humerus. There was no limitation of motion of the shoulder joint. X-ray examination was thought to show a separation of the epiphysis of the humerus. A cast was applied and kept on for several weeks. When it was taken off, a second x-ray examination revealed practically the same change as was seen in the first. In the interval, however, he had been entirely relieved of all symptoms. This followed in a few days after the cast was applied, and when the cast was taken off he said that his arm was all right and felt as well as ever.

Was there a true separation of the epiphysis? Should the cast have been left on longer?

*Answer.*—The fact that the two x-ray plates were the same and all symptoms were relieved probably indicates no epiphyseal separation was present. The relief of pain by the use of a cast suggests that there was an epiphysitis, an arthritis, or some other type of inflammation of the shoulder joint. No further treatment is necessary.

2. *Question.*—I am desirous of getting information about a drug known as "Yatren." What is its value in the treatment of any form of colitis? Is free purgation following two to four pills four times daily a concomitant of its use, or more likely related to the colitis? Is it indicated in amebiasis? Is it merely empirical, or is it accepted?

*Answer.*—"Yatren" is a drug which is specific for the destruction of amebae. Its use in other forms of colitis is not recommended. The continuation of the colitis after the use of "Yatren" probably indicates that the lesion was due to some other factor. The drug is recognized and widely used. Have you examined the stools for amebae, or is the patient suffering with nonspecific ulcerative colitis or a form due to the normal flora of the bowel? If no amebae are present and the colitis is of the nonspecific type, it is doubtful if "Yatren" would have any effect.

3. *Question.*—I saw a patient not long ago with a red edematous mass which started with the left trapezius muscle and extended over the clavicle down the chest to the fourth rib and straight across and up the other clavicle to the right trapezius muscle. The spaces above and below both clavicles were evenly filled with this edema and were very tender to touch. Patient was clear mentally, and had no chills or sweats. Morning temperature ranged from 100 to 101; afternoon, 102. Leukocytes 20,000. Pulse 90 to 102. When first seen, patient had no edema but complained of intense pain. She was not able to stand it without morphine. Shortly after this,

the edema started and spread as described, but did not affect either the neck or shoulder joints. She admitted that she had cut herself slightly a few days before while butchering hogs. Had used no antiseptic as it did not bleed. This area had become very tender; was covered with a bleb when I saw it. Applications of cold were made to the edematous part, which reduced it considerably. I thought of the possibility of erysipelas and gave the serum, with the resulting drop of temperature. Condition remained fairly stationary for a day or two, and then recurred. Should this lesion be opened by multiple incisions?

*Answer.*—The most probable diagnosis is cellulitis. No pus is present in the more virulent forms. The most one can expect after opening is a little thin, cloudy fluid, but even this may be absent. A smear or culture of the region would reveal the causative organism. Wide and free drainage might help.

4. *Question.*—I have a patient, a middle aged woman, who has been sick for the past three weeks. She complains of sharp epigastric pain, nausea and vomiting, and moderate prostration. She has no chills, fever, or sweats. There is no jaundice or other signs of obstruction of common bile duct. She is an obese individual and has never had trouble like this before. An x-ray of the stomach and duodenum shows no signs of ulcer. An x-ray of the gall-bladder region is also negative. The pain, which is very sharp, usually comes on about three or four o'clock in the morning and interferes with sleep. The first few nights, I think, she had some relief from food. I have had her on ulcer management, but this does not seem to help her any. The patient also complains of some pain in the daytime, but this is not as marked as the night pain. She vomits a great deal with the attacks.

What are the other diagnostic possibilities and what should be done to relieve the condition?

*Answer.*—In an obese woman, the possibility of para-esophageal hernia should be considered. An article on this subject appeared in a recent number of MINNESOTA MEDICINE. Hernia at the esophageal hiatus cannot be diagnosed clinically. As a rule, it is necessary to make an x-ray examination with the patient in the recumbent position. This allows the stomach to slip up in the opening and may reproduce the attacks the patient describes. Pancreatitis is another possibility. Swelling of the pancreas might be visualized if the duodenum is widely separated. Clinical diagnosis of pancreatitis is rather vague and cannot be made with any certainty. I would advise you to investigate the possibility of diaphragmatic hernia. If this is present, it is possible to operate on the patient and sew up the hernial opening.

## OBITUARY

### Paul Frederick William Wiperman

1888-1930

Dr. Paul Frederick William Wiperman, well known to the profession in Minnesota, died on the morning of January 2, 1930, following a month's illness due to a streptococic infection. At the time of his death he was superintendent of the Touro Infirmary at New Orleans.

Dr. Wiperman was born November 26, 1888, on his grandfather's farm in Warren County, Missouri, the son of a Methodist minister. He received his degree of A.B. from the Central Wesleyan College at Warren, Missouri, and then worked his way through the medical school at the University of Minnesota, where he graduated in 1913. While at the medical school he played on the basketball team for three years and captained a championship team his Senior year.

After serving his internship in the Minneapolis General hospital Dr. Wiperman began practice at Albany, Minnesota. In 1915 he became medical examiner for the Twin City Rapid Transit Company and in 1917 enlisted as Lieutenant in the Medical Corps, which took him to Fort Riley and San Antonio. Upon being mustered out of the army he organized the Veterans' Service Clinic in Minneapolis and in 1922 was appointed commanding officer of the U. S. Veterans' Hospital No. 30 at St. Louis. From 1923 to 1928 Dr. Wiperman superintended the Decatur and Macon County hospital in Illinois and for the past year has been the head of the Touro Infirmary in New Orleans.

Dr. Wiperman is survived by his father and mother; one sister, Mrs. Ernest Sears; his wife, formerly Miss Erna Snell of Fairfax, Minnesota; and a son, Frederick.

### H. N. Hovde

1861-1929

Dr. H. N. Hovde, aged 68, prominent practising physician at Duluth, Minn., died suddenly from a heart attack Dec. 24, 1929, while attending a patient.

Born in Norway, Dr. Hovde studied medicine at the University of Oslo, and in 1889 came to the United States. He settled and practised in Vermilion and Sioux Falls, S. D. In 1900 he moved to Duluth, where he had been practising since.

For twelve years, until 1927, Dr. Hovde was a member of the St. Louis county poor commission, and took an active part in this work. He was also a member of the St. Luke's hospital staff and of the local and state medical organizations.

Surviving him are his wife; two daughters, Mrs. Arnold Berg, Duluth, and Miss Valborg Hovde, who teaches school at Hibbing, Minn.; one son, Dr. Rolfe Hovde, of Winthrop, Minn.; and grandchildren.

### A. G. Moffatt

1865-1929

Dr. A. G. Moffatt, of Howard Lake, Minn., died at his home Dec. 18, 1929. Dr. Moffatt had practised in Howard Lake for 32 years. He was for several years president of the Wright County Medical Society, was a member of the State Medical Association and the board of medical examiners. During the world war he held the rank of captain and was stationed at Ford Sheridan.

Dr. Moffatt was 64 years old. He is survived by his widow; two daughters, Mrs. E. W. Ryley of Honolulu, and Mrs. W. T. Campbell of Minneapolis; and two sons, A. M. Moffatt of Chokio, and Dr. R. H. Moffatt of Morris, Minn.

## TRUTH ABOUT MEDICINES

(Continued from Page 127)

**Merthiolate—Sodium Ethylmercuri Thiosalicylate.**—Merthiolate contains from 49.15 to 49.65 per cent of mercury in organic combination. Merthiolate is a potent germicide for spore-bearing and non-spore-bearing bacteria. It is used for sterilizing tissue surfaces. It does not precipitate with serum proteins. Merthiolate is much less toxic than mercuric chloride. Merthiolate is supplied in the form of merthiolate solution 1:1,000, containing 1 gram of merthiolate in 1,000 c.c. of water, buffered with 1.4 Gm. of sodium borate in 1,000 c.c. and containing sodium chloride to make the solution approximately isotonic. Eli Lilly & Co., Indianapolis. (Jour. A. M. A., December 7, 1928, p. 1809.)

**Polyanaerobic Antitoxin.**—An anaerobic antitoxin (New and Non-official Remedies, 1929, p. 346) prepared by immunizing horses with the toxins of *B. tetani*, *B. Welchii*, *Vibrio septique* and *B. oedematiens*. It is marketed in bottles containing 100 c.c., each 100 c.c. containing at least 5,000 units of tetanus antitoxin, 75 units of Welch bacillus antitoxin, and sufficient antitoxin to neutralize 50,000 minimum lethal doses of *Vibrio septique* toxin and 100,000 minimum lethal doses of *B. oedematiens* toxin. Cutter Laboratory, Berkeley, Calif.

**Normal Horse Serum Without Preservative.**—A normal horse serum (New and Non-official Remedies, 1929, p. 344) marketed in packages of one vial containing 100 c.c. H. K. Mulford Co., Philadelphia.

**Sulpharsphenamine-De Pree, 0.9 Gm. Ampules.**—Each ampule contains sulpharsphenamine-De Pree (New and Non-official Remedies, 1929, p. 71), 0.9 Gm. De Pree Chemical Co., Holland, Mich. (Jour. A. M. A., November 23, 1929, p. 1649.)

**Thompson's Maltose and Dextrin.**—A mixture containing maltose, 51 per cent; dextrins, 45 per cent; sodium chloride, 2 per cent; and moisture 2 per cent. On the claim that maltose is more readily assimilated than other forms of sugar, Thompson's maltose and dextrin is proposed to supplement the carbohydrate of cow's milk or of water modifications of cow's milk. Thompson's Malted Milk Co., Inc., Waukesha, Wis. (Jour. A. M. A., December 21, 1929, p. 1971.)

## PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of December 11, 1929

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 11, 1929. Dinner was served at 7 p. m. and the meeting was called to order at 8 p. m. by the President, Dr. C. N. McCloud. There were 49 members present.

Minutes of the November meeting were read and approved.

The Secretary read the Annual Secretary's and Treasurer's reports. A motion was carried that they be accepted. Dr. Drake included in his Secretary's report his resignation as Secretary-Treasurer. A motion was carried that a rising vote of thanks be given to Dr. Drake for his faithful and efficient service to the Academy.

Dr. Geo. D. Head read, for Dr. J. W. Bell, the following report of the Committee appointed to draw up a memorial to Dr. Louis A. Nippert, and a motion was carried that this be spread upon the minutes of the Academy and a copy sent to Dr. Nippert's family:

LOUIS ALBERT NIPPERT, 1860-1929. The Minnesota Academy of Medicine is again called upon to mourn the death of one of its oldest and most revered members, Louis Albert Nippert.

He was born in Basel, Switzerland, April 14, 1860. His father was a Methodist clergyman who at one time was President of the Methodist Theological Seminary at Frankfort-on-Main, Germany. His early education was carried on in the schools of Switzerland and preparatory to his college course he took work in the gymnasium and polytechnical high school at Karlsruhe, Germany. His parents later came to this country and located in Cincinnati, Ohio, where he completed his academic education.

Dr. Nippert began his professional studies in 1880 at Miami Medical College, Cincinnati, graduating in the class of 1883. After a year spent as an intern in the Cincinnati Hospital and a year as resident physician, he took post-graduate work in Paris and Vienna and then located in general practice in Minneapolis in April, 1885.

He was married in June, 1888, to Miss Mary Rauhen. A daughter, Lillian, and a son, Rauhen Louis, were born of this union, the son dying in 1909. Surviving him are his wife; his daughter, Mrs. E. F. Zelle; four brothers, Dr. Henry T. Nippert of St. Paul, Dr. Edgar Nippert of Los Angeles, Judge Alfred Nippert and Herman Nippert both of Cincinnati; and three sisters, two living in Cincinnati and one in Seattle.

Dr. Nippert died from a cranial fracture sustained while riding his horse, November 6, 1929.

Beginning his professional career as a general practitioner he developed those fine qualities of heart and mind born of the hard and trying experiences of a pioneer doctor. To a large clientele, many of his patients being poor or in moderate circumstances, he

gave the best that was in him at all times without thought of his own comfort or health.

His later years were devoted to consultation practice in Internal Medicine. His large experience, analytical mind, splendid medical training, and cheering personality admirably fitted him for this specialty. The outstanding qualities of his character were his loyalty to the high ideals of his profession and his faithfulness to duty. A number of times the profession had honored him without self-seeking on his part. He was elected President of this Academy in October, 1912, and took office in November, 1912. His Presidential Address was entitled "The Etiology, Diagnosis and Treatment of Acute Infections of the Pleura and Lungs." He was also elected to the presidency of the Hennepin County Medical Society.

He was appointed Instructor in Clinical Medicine in the Medical School of the University of Minnesota in 1898, and was made Professor of Clinical Medicine in 1902. Many of his old students, some of them members of the Academy, will remember the practical character of his instruction, well-grounded in a thorough knowledge of anatomy and pathology. He served the University and the state as a medical teacher until the reorganization of the faculty in 1913, at which time he resigned.

In 1907 Dr. Nippert again studied in Europe and spent much time in the hospitals and clinics.

He was a charter member of the Minnesota Society of Internal Medicine, and, in spite of the fact that a physical infirmity made it difficult for him to do so, he was always present at the all-day sessions of this Society.

The Staffs of Abbott Hospital and Hillcrest Hospital were honored by his name upon the list of their active membership.

The following is a bibliographic list of his contributions to medical literature:

Septic Endocarditis. *Northwest Lancet*, 1904, Vol. 24, p. 39.

General Considerations in the Treatment of the Earlier Stages of Pulmonary Tuberculosis. *Northwest Lancet*, 1905, Vol. 25, p. 183.

Diagnosis and Therapeutics of Pneumonia. *Medical Brief*, St. Louis, 1907, Vol. 35, p. 179.

Observations on the Methods of Diagnosis in some of the Clinics of Germany. *Jour. Minn. Med. Assn.*, 1908, Vol. 28, p. 197.

The Diagnosis and Treatment of Incipient Tuberculosis. *Jour. Minn. Med. Assn.*, 1908, Vol. 28, p. 508.

The Etiology, Diagnosis and Treatment of Acute Infections of the Pleura and Lungs. *Journal-Lancet*, 1913, Vol. 33, p. 249.

Prognosis and General Management of Pneumonias. *Journal-Lancet*, 1921, Vol. 41, p. 66.

The Committee: J. W. BELL  
GEO. D. HEAD  
S. MARX WHITE.

The annual election was held at this meeting, and the counting of the ballots showed that the following



members were unanimously elected as officers for the year 1930:

President—Dr. Gustav Schwyzer (Minneapolis).  
Vice-President—Dr. James S. Gilfillan (St. Paul).  
Secretary-Treasurer—Dr. R. T. LaVake (Minneapolis).

Dr. J. M. ARMSTRONG (St. Paul) showed several original first volumes of medical magazines published in the United States:

1. In 1797 the first scientific periodical publication and the first medical journal was published in North America. This is a copy of Volume I of that journal "The Medical Repository" published in New York (1797-1824). Volume I contains nothing of particular value to us at the present time and much of the material in it is not strictly medical. You may look it over and judge for yourselves. However, it must have filled "a long-felt want" as Volumes I and II were reprinted in 1802 and again in 1804. This particular volume I hand you is the 1804 reprint. Many interesting things might be said about its Editor but time does not permit.

2. This second volume is the first volume of "The Philadelphia Medical and Physical Journal" which was published from 1804 to 1809. There are one or two curious items in it. Whether it can be called the second medical journal published in the United States, I do not know, as the Philadelphia Medical Museum was published also in 1804 and ceased in 1811. I have no copy of this latter journal.

3. This third volume is the first volume of the "New England Journal of Medicine and Surgery" published in Boston in 1812. We are fortunate in having a full set of twenty-seven volumes in our Ramsey County Medical Library. If you will look over the table of contents you will find the names of many of the notable medical men of Boston among the contributors.

4. This fourth volume is Volume I of "The American Medical Recorder" published in Philadelphia in 1818. It continued publication until 1829. There are some quite interesting articles in this volume and also in the succeeding volumes but I cannot take the time to show the other volumes though we have a run of the first seven volumes.

5. This fifth volume is the first volume of "The Philadelphia Journal of the Medical and Physical Sciences" published in 1820, Nathaniel Chapman, editor. I call your attention to the title page where you will find printed the following quotation from the Edinburgh Review, No. LXV: "In the four quarters of the globe, who reads an American book or goes to an American Play? or looks at an American picture or statue? *What does the world yet owe to American Physicians or Surgeons?* (The italics are Chapman's, not Sidney Smith's.) Chapman was an Edinburgh graduate himself but was a thorough Philadelphian also and this statement was galling. He would start a medical journal and show the world the injustice of this statement. The journal continued under this name until 1827, when Isaac Hays, who had been assistant editor for a year, became editor. Hays thought the Journal

should be more national in character and changed its name to "The American Journal of the Medical Sciences," under which name it is now conducted and well known to all of you as one of the foremost medical periodicals of the world. There is no doubt Chapman made good when he challenged Sidney Smith.

I might say that Sidney Smith was hardly correct, as Dorsey's Surgery was in 1818 reprinted in Edinburgh for use as a textbook in that University. John Syng Dorsey wrote the first American treatise on Surgery, published in 1813. I will show it to you some other time. Isaac Hays edited this great journal from 1826 to 1869 and after his death his son, I. Mimis Hays, was editor until 1901. Thus for 75 years it was "Hays' Journal" and so known to many of the past generation. With the exception of the Edinburgh Medical and Surgical Journal, the American Journal of the Medical Sciences is the oldest medical periodical in the world. The whole history of American Medicine and the progress of Medicine during its life may be found in its pages.

6. This collection of papers, while not strictly copies of a medical journal, are of intense interest and a literary curiosity, as the "Rush-Light" was published weekly in New York for the sole purpose of heaping abuse and ridicule on Dr. Benjamin Rush of Philadelphia. It was published by Wm. Cobbett, who wrote sharp articles under the name of Peter Porcupine. Cobbett was the proprietor of the "Porcupine Gazette" of Philadelphia, published as a Democratic organ under the patronage of Thomas Jefferson to discountenance the Federalist party, which was strong in Pennsylvania. Porcupine, in his abuse of Rush, went a step too far and, instead of confining his remarks to Rush's political activities, abused him as a physician. Rush sued Cobbett for libel. The suit being tried before a Court with Federalist leaning, a verdict of \$5,000 was obtained—an enormous sum in those days. Cobbett fled to New York and retaliated by publishing the "Rush-Light." Five weekly numbers were gotten out. Early in 1800, when the Federalist party made it too hot for him even there, he went to London and printed two more copies. I show you the copies printed in New York and hope at some time to secure the remaining numbers. Cobbett readily obtained employment as a political pamphleteer in England and was later elected to Parliament. (See McMaster's History of the People of the United States, and the Encyclopedia Britannica, under Cobbett.)

Last year the Academy decided to award a medal at its annual meeting to the member making the most noteworthy contribution to its program during the year. The special Awarding Committee, consisting of Drs. Colvin, Gilfillan and Bouman, this year decided to award the medal to Dr. Arnold Schwyzer of St. Paul.

Dr. A. R. COLVIN (presenting the medal for the Committee): Perhaps it is quite unnecessary, in presenting this medal to one whom you all know so well, to say more than that it gives us all great pleasure to present it. It may, however, be well to say that the

decision to award it to Dr. Arnold Schwyzer was enthusiastically unanimous as to the Committee and also as to the Academy.

In awarding this first medal for the most noteworthy and valuable contribution to the Academy for the past year, it is impressive that the recognition has been of the value of the presented experiences from the wide range of daily work of an earnest worker, combined with the interesting and constructive discussion of the work of others presented here. Experience looms large in medicine, and when experience comes from a broad, deep and original thoughtfulness and is presented with youthful enthusiasm, it is of utmost value to the Academy.

Allow me, Sir, to present with great pleasure the medal awarded by the Academy for the most noteworthy contribution during the past year.

The Committee: A. R. COLVIN, Chairman.

JAS. S. GILFILLAN

H. A. H. BOUMAN.

DR. ARNOLD SCHWYZER (accepting the Academy Medal): I surely feel that this is a very great honor, but I think the Committee might have chosen better when I look around and see the number of men who have made excellent contributions to this Academy. I assure you that I feel very very deeply when I express my appreciation of this testimonial. When an appreciation comes from the men with whom one works and meets all the time, I am sure it is worth more than when it comes from the outside. Though I can't quite see how I have earned it, I thank you heartily.

DR. H. A. H. BOUMAN showed an enlarged drawing of the medal and gave the following interpretation:

White civilization while confined to Europe was in great danger a number of times of becoming overwhelmed by the Asiatics. The invasion of the Persians was one of the early historical occasions. The Greeks, under the leadership of Athens, defeated the enemy and dispelled all fear of future invasion. The will to live and to be free men had been hammered out during the years of bitter warfare and a national accomplishment of the first magnitude was theirs. Gratitude and exaltation forced expression; they built the Parthenon on the Acropolis in the sight of all to honor Minerva, their beloved Pallas Athene. The incomparable period of Pericles, which stocked the East and the West with pioneers and leaders, must honor Minerva. Menos, the indomitable mind, striving for the best things in man, his art; the deified personification of this mindedness can be seen in plastic form on the face of this medal. The bust of a marvelous woman; she was not born like others, but sprang from the lofty forehead of Zeus. The head of Gorgo indicates her father's Aegis—the wonderful shield. The visor is tilted back. In peace or war that wondrous human face radiates serene composure and patience, dignity and determination and persistent energy.

All those who brought forth their talents to be used and amplified looked upon her as their patroness; she was the illusiveness of their lives and their realizations. The spirit, that persists to do and accomplish, ruled them whom we call the Salt of the Earth in our day.

DR. HAROLD HULLSIEK (St. Paul) read his Thesis, entitled "Adenomatous Polyps of the Sigmoid and Rectum"; this was illustrated with numerous lantern slides.

#### DISCUSSION

DR. DONALD BALFOUR (Rochester): I enjoyed very much hearing this thesis. Dr. Hullsiek has referred to one very important fact of which we should often be reminded; that is, the necessity for routine rectal examination in all patients. In spite of this being a platitude, one still finds many patients with a lesion of the rectum, sigmoid and colon, associated with bleeding, and who have had, in the immediate past, an operation for hemorrhoids to relieve them.

DR. THEODOR BRATRUD (Warren, Minn.): The subject of Dr. Hullsiek's interesting paper interests me particularly with reference to the diagnosis of "intussusception."

I reported in 1914 the case of a 16-year old girl who came to us in 1913. She gave a history of several attacks of vomiting and was vomiting when brought in. We gave her an enema and she had a profuse foul stool. After this, a mass could be felt above the left Poupart's ligament. She started vomiting again and we found an intussusception. We could palpate two small tumors in the sigmoid. These were excised. The stump bled quite freely, so it was whipped over with catgut. The tumors were a little larger in size than a walnut.

She did well until the 14th day postoperative—when she was going to go home, but started vomiting again. This time we found an intussusception on the right side. On opening the abdomen we found that she had an intussusception of the ileum, cecum and ascending colon. We could palpate several more masses in the lower ileum which, on opening the ileum, showed us a group of tumors similar to those in the sigmoid. At that time, we made a general exploration of the abdomen and found a mass higher up to the left of the midline about the size and consistency of a banana. On delivering this mass, we found an intussusception and in this area we found several more tumors similar to those in the sigmoid, which were excised.

After the second operation she was well for about five years, when she was brought to the hospital in a moribund condition. The postmortem showed the lower ileum, cecum and colon intussuscepted almost down to the anus and the bowel was filled with numerous adenomatous polypoid masses.

A year later a 4-year old boy was brought in with a diagnosis of appendicitis. We found an intussusception of the lower ileum, cecum and ascending colon which we could not reduce. A resection with end-to-side anastomosis was done. In the resected piece of bowel we found multiple tumors which were more polypoid in structure than adenomatous. To date, this boy has been well.

We had a case this year of a 70-year old man, very anemic, who had been bleeding for about a year. We found seven polyps in the sigmoid, which were removed by high frequency current. The bleeding stopped and he improved for two or three months but now has

masses in the liver, a great deal of pain in the spine and is going down hill very rapidly.

DR. L. C. BACON (St. Paul): It is sometimes interesting to know what nature does with these rectal growths. This excellent paper recalls to my mind a case I saw many years ago. A child 6 years of age had a rectal polypus within reach of the finger. The family refused operation though repeatedly urged to consent. I had an opportunity to follow that case to termination. The pedicle gradually elongated over a period of 6 or 8 months and eventually there was no polypus there. Nutrition must have been cut off through traction upon or twisting of the pedicle and separation occurred.

That case has made me feel that in children, especially in outlying districts, nature certainly does take care of some of them. I am not advocating leaving these cases—not by any means.

DR. H. T. NIPPERT (St. Paul): I attended a meeting of the Tri-State several years ago and some man made the statement at one of the sessions, "Don't be afraid to put your finger in the rectum, otherwise you might get your foot in it."

DR. HULLSIEK thanked the members of the Academy for their discussion of his paper.

DR. F. E. B. FOLEY (St. Paul) gave a report of "An Unusual Case of Extra-Vesicle Urinary Drainage" and showed several lantern slides. He also discussed the embryology and development of these anomalies of the urinary tract.

#### DISCUSSION

DR. ARNOLD SCHWYZER (St. Paul): We owe thanks to Dr. Foley for his splendid presentation of this subject. In listening to him, one cannot help but be impressed by the fact that the more we know the fine points in these anomalies, the more we can find conservative measures. I have heard tonight expressed the respect for the renal parenchyma, and I think that is a very important point. The saving of the parenchyma, if there is a possibility to readjust things, is very important, especially in women with possible pregnancies which may make great demands on the kidney substance.

The variety of anomalies shown here is very interesting and instructive. To emphasize the preservation of what can be saved, let me mention a case I saw yesterday. It is a woman on whom I had done a heminephrectomy, or rather a resection of one-third of the kidney, seventeen and a half years ago. The young woman was brought into the hospital after four weeks' illness. During the last week she had severe chills every day and high temperatures, some pain in the right kidney region, with some albumin and cloudy urine. At operation we found the upper third of the kidney riddled with abscesses. We incised through that upper pole and a little beyond. These abscesses were spread all through the thickness of the parenchyma, but stopped abruptly in a straight line toward the remainder of the kidney. The removal of that upper third of the kidney, with the preservation of the other two-thirds, allowed this woman to face the future

with two kidneys. She has since married and has gone through pregnancy without trouble. The result in that case was very gratifying. The patient has had no trouble from that kidney.

In a case of double renal pelvis with hydronephrosis in the upper one, we made an anastomosis between the upper hydronephrotic and the lower normal pelvis. This also gave quite a satisfactory result. The operation was over eight years ago, and the patient is in good shape. This was a pyelo-pylostomy.

The meeting adjourned.

R. T. LAVAKE, M.D.  
Secretary.

## PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

## MEDICINE

### SUPERVISORS:

F. J. HIRSCHBOECK,  
205 W. 2nd STREET, DULUTH  
THOMAS A. PEPPARD,  
LA SALLE BLDG., MINNEAPOLIS

**MULTIPLE INTERCOSTAL NEURECTOMY FOR PULMONARY TUBERCULOSIS:** John Alexander (Amer. Rev. Tuberc., 1929, XX, 637). The author resected the phrenic and intercostal nerves on one side of a dog and obtained almost total immobility of that side of the chest as well as a marked falling in of the ribs overlying the lung. Since then he has performed this operation on six patients who were considered too poor a surgical risk for the more drastic procedure of thoracoplasty. Resection of the second to eleventh intercostal nerves together with homolateral phrenic exeresis puts that side almost completely at rest during quiet respiration, due to paralysis of all muscles involved in quiet respiration and in addition some of the accessory muscles used in forced respiration. The remaining unparalyzed accessory muscles function in the necessary cough reflexes and raising of accumulated pulmonary secretion.

Indications for intercostal neurectomy are similar to those for artificial pneumothorax, thoracoplasty and phrenectomy.

The lesion must be predominantly unilateral and artificial pneumothorax or phrenicectomy or both

together should have been given a fair trial and found insufficient due to adhesions. Intercostal neurectomy is the choice in preference to thoracoplasty in patients with poor general cardio-circulatory condition, or too great age to justify even a primary stage thoracoplasty. The chief contraindication is a large amount of sputum (100 c.c. per day) that the patient might be unable to raise because of impairment, by the operation, of the power to expectorate.

The technic of the operation consists mainly in making an incision over the angles of the ribs from the second to the eleventh rib. The intercostal muscles are then incised midway between the ribs, the incision centered at the angles of the ribs, two to three centimeters of each intercostal nerve is resected from the second to the eleventh inclusive, care being taken not to damage the posterior rami that supply the sacro-spinal muscles.

Intercostal neurectomy is not intended as a substitute for thoracoplasty. The former may be used in the cases not suitable for thoracoplasty. Such patients include both those who are too ill for thoracoplasty and those that are not ill enough, and yet for whom further aid is necessary in order to bring about arrest of the disease.

E. F. ALLISON, M. D.

**PLACE OF THE HOSPITAL IN THE PROMOTION OF PUBLIC HEALTH PROGRAMS:** Matthias Nicoll, Jr., M.D. (Hospital Social Service, 1929, XX, 456). The hospital must be counted as an integral part of any health program. A tuberculosis sanatorium should be the center of anti-tuberculosis work, especially throughout the rural districts; the superintendent should be on a full time basis and should be a technical adviser on tuberculosis with administrative and teaching capacity to insure the confidence not only of patients but of the local medical profession.

The problem of the care of the insane and mentally defective can only be solved by adequate appropriations for special hospitals.

As recently pointed out by Professor James Ewing, the provision of facilities for diagnosis and treatment of early cancer is a public responsibility which cannot be escaped.

There is a great scarcity of institutions to which post-operative orthopedic cases and others handicapped by disease and accident may be sent for rehabilitation so that they may become self supporting. Such institutions should provide training for orthopedic nurses.

The hospitalization of maternity cases seems logical but a careful study of the equipment and methods of obstetrical service in such hospitals is the duty and responsibility of the organized medical profession at the present time.

The provision of hospital facilities in the rural districts, of community hospitals, properly planned and

operated, seems to be a recognized means of securing the retention of capable physicians in such localities, and so securing not only adequate medical attention in both the homes and the hospital. When well established, such hospitals will serve as centers for State and local health services, such as public health nursing, prevention of diphtheria, prenatal care, child welfare clinics, and, in the absence of a local tuberculosis hospital, tuberculosis clinics. It may well be the meeting place also for conference between health officials, state and local, and the general medical profession.

A. T. LAIRD, M.D.

## SURGERY

### SUPERVISORS:

DONALD K. BACON,  
LOWRY BLDG., ST. PAUL

VERNE C. HUNT,  
MAYO CLINIC, ROCHESTER

**OVARIAN TRANSPLANTATION:** Chas. C. Norris and Charles A. Behney, Philadelphia (Surg., Gynec. & Obstet., Vol. XLIX, No. 1929, No. 5, 642). What the reaction of the patient to surgical menopause will be is best predetermined by the temperament. The nervous, highly developed, neurotic married individual is prone to suffer most. In selected cases, therefore, where conservation of the ovary has been impossible, ovarian transplants or grafts are desirable.

The series reported consists of patients in the child bearing age and in whom only autotransplantation was done. Practically all were suffering from pelvic inflammatory disease in the chronic stage. The Blair-Bell technic was closely followed in the earlier cases. In later cases the ovary after decapsulation was divided in two, three or four portions and transplanted in separate pockets in the rectus muscle. This method results in better blood supply to each part and higher percentage of "takes." Small grafts not more than eight millimeters in diameter and considerably less in thickness have been most satisfactory.

Advantages in this type of graft are:

1. Complications rarely develop.
2. Should complications occur they are easily handled, being extraperitoneal.
3. Grafts usually "take."
4. The sudden development of the menopause is generally averted, and when it occurs is more analogous to the normal than if the grafting had not been performed.

The life of the transplanted ovary is probably not more than two or three years. The grafts may become tender for a day or two each month but rarely give serious trouble.

C. W. MAYO, JR.



**ACUTE EDEMA OF THE PANCREAS:** Edward Archibald (*Ann. Surg.*, 1929, XC, 803-816). By the transduodenal injection of non-infected bile directly into the pancreatic duct the author has repeatedly produced changes in the pancreas of animals which both grossly and microscopically appear to represent acute edema without necrosis. The effect appeared identical when either gall bladder bile or hepatic duct bile was employed. The beginning of this change could be observed grossly within half a minute after the injection. After the elapse of five minutes the major portion of the pancreas had become involved. Care was taken not to inject the bile under pressure. Operation upon the same animals several days later revealed almost complete subsidence of the process both grossly and microscopically. The similar use of infected bile caused the graver lesion of necrosis.

Archibald feels that a condition may exist in the human similar to that which he has been able to produce in animals by the injection of non-infected bile into the pancreatic duct. In substantiation of this persuasion he reminds the reader that not infrequently patients who have had an interval exploration because of a history of repeated short abdominal colics have been found to have a negative abdomen at operation. The inference that the pathologic process had subsided during the interval he thinks quite logical. He further cites a case of his own in which he operated before complete regression of the acute attack had occurred. At operation palpation disclosed definite enlargement of the pancreas, but he was unable to visualize the organ. As further evidence that such a condition may exist he reviews the work of Zoepffel, who in 1922 described acute edema of the pancreas found at operation during the acute stage of the common variety of gall bladder colic.

The symptoms suggesting such a condition consist of severe pain located in the epigastrium with radiation to the left abdomen and left back, associated with localized tenderness over the pancreas and a corresponding area of skin hyperesthesia.

The author feels that all patients having symptoms suggesting such a diagnosis should undergo exploration because of the inability to determine which cases may, if operation be postponed, be found to have acute pancreatic necrosis. The principle of the operative procedure he thinks should be that of bile drainage for one to two months in order to eliminate further similar attacks. He recommends cholecystostomy and removal of stones if present; if cholecystectomy has already been performed, choledochostomy.

JOSEPH B. PRIESTLEY, M.D.

## EYE, EAR, NOSE AND THROAT

**SUPERVISORS:**  
**VIRGIL J. SCHWARTZ,**  
MEDICAL ARTS BLDG., MINNEAPOLIS  
**ARTHUR C. DEAN**  
HOT SPRINGS, SOUTH DAKOTA

**STENOSIS OF THE NASOPHARYNX:** F. A. Figi, M.D., Rochester, Minnesota, *Arch. of Otolaryng.*, Nov., 1929, 10, 5, 480). Stenosis of the nasopharynx is usually acquired, but there are a few cases of true congenital stenosis in the literature. In the cases of acquired stenosis, syphilis is generally considered to be the most common cause. The next most common causes are trauma, diphtheria, tuberculosis, congenital anomalies and inflammatory lesions.

In the cases seen at the Mayo Clinic the most common cause was trauma incident to the removal of tonsils and adenoids. The interval between the time of operation and the onset of symptoms varied from a few weeks to two years. In about 40 per cent the trouble developed during the first decade of life and in more than 50 per cent the onset was before the age of 20.

The nasopharyngeal stenosis seen in cases of scleroma is always concentric and appears to be due as much to infiltration and thickening of the wall of the nasopharynx as to cicatricial contraction. The symptoms are dependent on the degree of obstruction. The patient often accustoms himself to breathing through a very small opening and may present few or no symptoms. With almost complete atresia the symptoms are those of nasal obstruction. Mucous membrane changes, sinus infection and deafness ensue. Anosmia may be present. Vocal resonance may be changed. Chronic inflammation of the pharynx may also be present.

Many and varied procedures have been advocated and tried for relief of this condition. The simplest and most successful procedure is that presented by Nichols. He inserted a silk suture through the small nasopharyngeal opening well into the lateral extent of the region of scarring. This suture was tied and left in place till a cicatrized tract developed. The posterior border was then freed from its attachment to the pharyngeal wall out to this point.

There has been a great change in the prognosis given patients with this condition in the past few years. The reports of Nichols and Mackenty are very optimistic. A favorable prognosis is given as a routine provided the patient is able to remain under observation for a sufficient length of time, varying from 3 to 8 months.

ARTHUR C. DEAN, M.D., F.A.C.S.

## BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

**THE CONQUEST OF CANCER BY RADIUM AND OTHER METHODS.** Daniel Thomas Quigley, M.D. Philadelphia: F. A. Davis & Co., 1929. 539 pages. \$6.00.

This is a well printed volume of 539 pages, containing numerous illustrations. Section IV contains extensive data on diseases other than cancer in which radium has proved of value. One almost wonders at times if this book was intended for the layman, since it largely lacks a scientific nomenclature and accuracy as well as methods of technic. For example, we are informed, "Cancer, instead of being a complex thing of which we know nothing, is a very simple thing of which we know a great deal. We probably know more about cancer than about any other chronic disease. The basic fact in connection with new growth of tumors, then, is irritation of living cells by micro-organisms and their toxins. No one micro-organism is known to have such a widespread distribution."

One meets frequently the terms "roots of the cancer," "baby cells," and on page 160 we are informed melanoma growing in the eye may arise from the retina. On page 158 the author speaks of glioma of the eye in the adult.

This writer has tremendous enthusiasm, reporting wonderful results, but he fails to indicate how he obtained these results. We can only wish he had given us a definite technic as to how such results are ob-

tained. Every radium worker welcomes information on this point.

Agreement is accorded his statement that the general practitioner has little conception of the physical properties of this very potent agent he is using and that radium service should be centered in well equipped radium hospitals with a trained personnel.

L. A. LANE, M.D.

**A STUDY OF MASTURBATION AND THE PSYCHOSEXUAL LIFE.** John F. W. Meagher. Second edition. 130 pages. Cloth, \$2.00. New York: Wm. Wood and Co., 1929.

This book presents a thorough study of the subject of masturbation. The importance of the well accepted principle that sex information must begin early in life is stressed, the best guide being the child's own questions. This essay helps to instill the proper insight into the psychosexual life of the child and adolescent that is vital to the proper attitude of the physician. A discussion of the auto-erotic, homosexual and heterosexual trends of the individual lays the proper foundation for the author's chief purpose. He finds masturbation an almost normal phenomenon for the child and adolescent, but not for the adult. The causes, symptoms, sequelae and treatment of this habit are carefully reviewed. His conclusion that we are dealing with a psychopathological problem, requiring sympathy and understanding rather than medicine or surgery, is in line with the best modern medical thought.

This is a valuable book for anyone interested in the psychology of adolescence. It should be read by parents, clergymen and doctors, especially pediatricians interested in mental hygiene.

D. M. SIPERSTEIN, M.D.

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